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Book

These Star People You Will See on Apr. 1st, at 9 o'clock in the Evening

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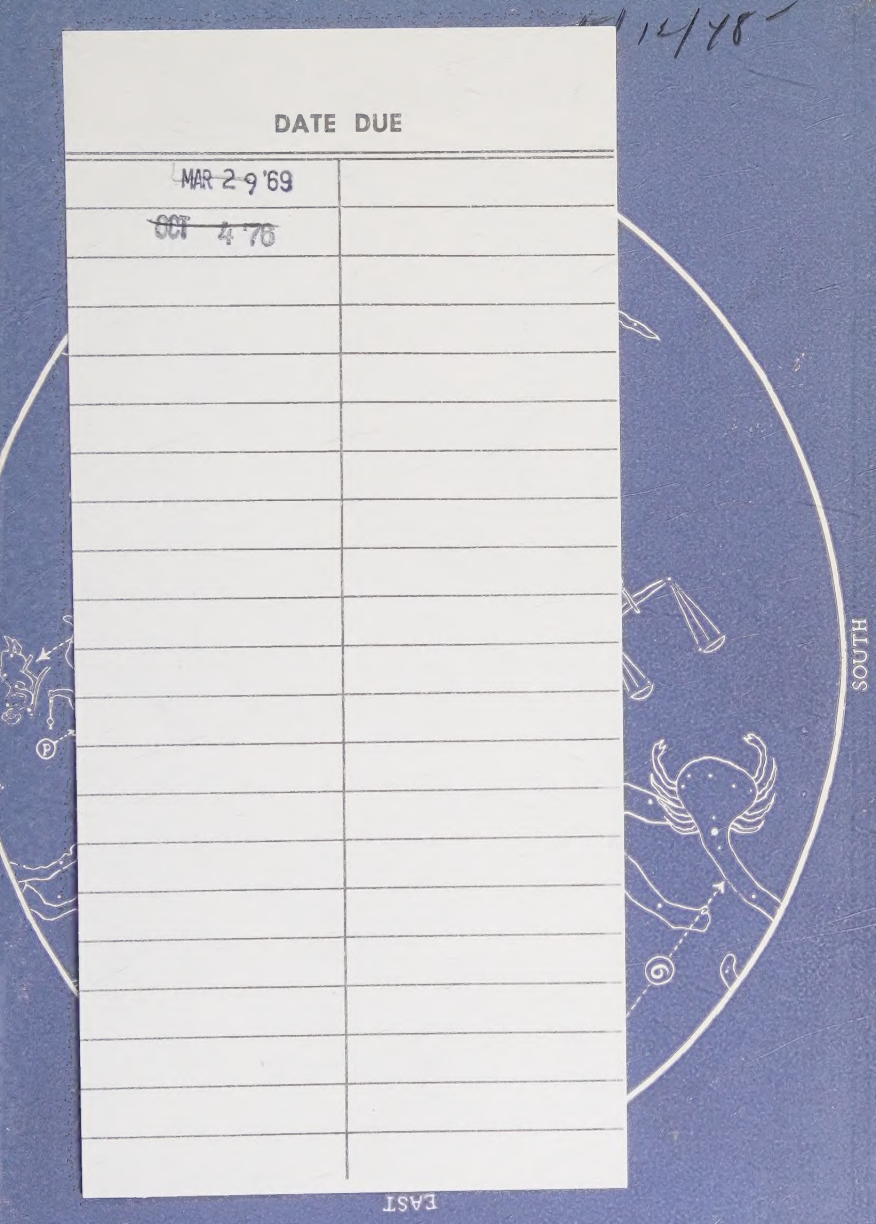

These Star People You Will See on July 1st, at 9 o'clock in the Evening

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THE STAR PEOPLE

THE MACMILLAN COMPANY
NEW YORK · BOSTON · CHICAGO · DALLAS
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MACMILLAN & CO., LIMITED
LONDON · BOMBAY · CALCUTTA
MELBOURNE

THE MACMILLAN CO. OF CANADA, LTD.
TORONTO

THE STAR PEOPLE

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HILLSBO

BY

GAYLORD JOHNSON

WITH DRAWINGS ON SAND AND BLACKBOARD BY "UNCLE HENRY AND THE SOCIETY OF STAR-GAZERS"

"Why did not somebody teach me the constellations, and make me at home in the starry heavens, which are always overhead and which I don't half know to this day?"

—*Thomas Carlyle.*

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TO
BABY ANNE

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TO HELP YOU FIND THE STAR PEOPLE IN THE SKY

Whenever Uncle Henry draws a line to point out one of the star people you will find a figure, close to what he says, like this: (10).

Find the same figure on one of the maps inside the front or back cover, and you will see the line that Uncle Henry drew—and find the star person or animal easily in the sky.

Numbers 1 to 17 can be located on the front cover maps. Numbers 18 to 32 can be found on the maps inside the back cover.

To Use the Maps

Face South and hold the map for the proper season over your head—with the top of the book toward the West and the bottom toward the East. You will then see the Star People in the same places they appear in the sky.

The maps are drawn for 9 o'clock on April 1st, July 1st, October 1st, and January 1st, but they will be found serviceable in the preceding and following month. When necessary consult the maps for the season coming before or after.

WHERE TO FIND THE "PEOPLE" YOU WANT

Names of Star People	*How to Pronounce*	*Where to Look in the Book*	*Where to Look on the Maps*	*When You Can See Them in the Sky*
Andromeda	(an-drom′-e-dä)	Page 70	Number 25	Sept. to Feb.
Aquarius	(a-kwā′-ri-us)	" 50	" 19	Aug. " Dec.
Aquila	(ak′-wi-lä)	" 48	" 17	June " Nov.
Aries	(a′-ri-ēz)	" 75	" 28	Sept. " Feb.
Auriga	(â-rī′-ga)	" 105	" 32	Oct. " June
Bootes	(bō-ō′-tez)	" 16	" 2	April " Oct.
Cancer	(kan′-ser)	" 73	" 27	Jan. " June
Canes Venatici	(kā′-nez ve-nat′-i-cī)	" 17	" 2	Feb. " Sept.
Canis Major	(kā′-nis mā′-jor)	" 62	" 22	Jan. " April
Canis Minor	(kā′-nis mī′-nor)	" 72	" 26	Dec. " May
Capricornus	(kap-ri-kôr′-nus)	" 49	" 18	Aug. " Nov.
Cassiopeia	(kas-i-ō-pē′-ya)	" 35	" 12	Jan. " Dec.
Cerberus	(seer′-ber-us)	" 38	" 14	April " Nov.
Corona Borealis	(kō-rō′-nä bō-rē-a′-lis)	" 33	" 11	April " Oct.
Cygnus	(sig′-nus)	" 21	" 4	June " Jan.
Delphinus	(del-fī′-nus)	" 44	" 16	June " Dec.
Draco	(drā′-ko)	" 23	" 5	Jan. " Dec.
Gemini	(jem′-i-ni)	" 59	" 21	Dec. " June
Hercules	(her′-kū-lēz)	" 38	" 14	April " Nov.
Leo	(le′-o)	" 20	" 3	Feb. " July
Leo Minor	(le′-o mī-nor)	" 20	" 3	Jan. " July
Lepus	(lē′-pus)	" 64	"	Dec. " March
Libra	(lī′-bra)	" 36	" 13	May " Aug.
Lyra	(lī′-ra)	" 25	" 6	April " Dec.
Ophiuchus	(of-i-ū′-kus)	" 42	" 15	May " Oct.
Orion	(ō-rī′-on)	" 56	" 20	Nov. " April
Pegasus	(peg′-a-sus)	" 67	" 23	Aug. " Jan.
Perseus	(per′-sūs)	" 102	" 30	Sept. " May
Pisces	(pis′-ez)	" 76	" 29	Sept. " Feb.
Sagitta	(sa-jit′-a)	" 26	" 16	June " Dec.
Sagittarius	(saj-i-tā′-ri-us)	" 27	" 7	July " Sept.
Scorpio	(skôr′-pi-ō)	" 29	" 9	June " Sept.
Serpens	(ser′-pens)	" 42	" 15	May " Oct.
Taurus	(tâ′-rus)	" 58	" 20	Nov. " April
Triangulum	(trī-an′-gū-lum)	" 75	" 31	Sept. " Feb.
Ursa Major	(er′-sa mā′-jor)	" 7	" 1	Jan. " Dec.
Ursa Minor	(er′-sa mī′-nor)	" 10	" 1	Jan. " Dec.
Virgo	(ver′-gō)	" 33	" 10	April " Aug.

Star People on Maps but not Talked About by "The Society"

(a) Hydra (hī′-dra,
(b) Crater (krā′-ter)
(c) Corvus (kôr′-vus)
(d) Cepheus (sē′-ūs)
(e) Cetus (sē′-tus)
(f) Eridanus (ē-rid′-a-nus)

THE STAR PEOPLE

THE STAR PEOPLE

FIRST EVENING

IN WHICH THE SOCIETY OF STAR-GAZERS IS FORMED AND DISCOVERS TWO BEARS—ONE WITH A STRETCHED TAIL

Uncle Henry sat on the porch of "Seven Oaks" Cottage, watching the new moon sink into the woods across Sand Lake.

The ripples of the motor-boat that had carried "Sister" and "The Children's Father" away from the dock had gone from the glassy water. Over across the lake, at Pentecost station, they would catch the ten o'clock train, to be gone a week.

Uncle Henry had urged "Sister" to go. He had said he was perfectly sure of being able to look after Peter and Paul and Betty for just seven days, but now that "Sister" was really gone Uncle Henry felt the size of the task he had undertaken.

Of course he wasn't alone. There was big, wholesome Katy, the maid. "Competent Katy," he had at once named her to himself on his arrival two weeks before. The sleeping, eating, and dressing of twin ten-year-old boys and a seven-year-old girl would go on as usual without Uncle Henry's assistance.

In the daytime he planned to take them fishing, berry-picking, sailing, and bathing. Target-practice

with Peter and Paul's air-rifle would help, too, and there would be walks in the woods, and up to Brighton's farm house for the milk every evening.

But between supper and bed was a gap that Uncle Henry thought might be hard to fill. He must think of some games. He didn't want to be a poor companion for his adored niece and nephews for even an hour of the time.

Uncle Henry blew a cloud from his pipe and watched it eddy slowly away, filtering through the leaves of the oak-branches at the side of the porch. Then he looked up to the vaporous band of the milky way. Stars hung in it, sparkling. It was like a chiffon streamer with tiny diamond spangles—or a cloud of smoke, blown, with sparks, from the pipe of Pan.

You will see right away that Uncle Henry was a poet, even if Pan's pipe wasn't the smoking kind. It might have been, as easy as not. Uncle Henry was wondering whether this last fancy might be made into a poem for his college paper, when the children's voices floated up from the beach. They were sitting on the smooth sand and singing in unison,

"Star bright, star-light—
Many's the star I see tonight.
Star bright, star-light—
Tell me, is it true?

I wish I may, I wish I might
Get the wish I wish tonight—
Star bright, star-light,
Tell me, is it true?"

Uncle Henry took his feet off the porch-railing and allowed his chair to use all of its feet again. Then he leaned out by a post and looked straight up into the blue-black vault of a moonless July night sky. The stars were beautifully clear.

Evidently Peter, Paul, and Betty were singing praise to the fact. They had clapped enthusiastically for themselves, and were now beginning the encore—a repetition of "Star bright, star-light."

Uncle Henry's face had become thoughtful, and now he stepped down from the porch, and strolled down the boards to the dock. There he stood craning his neck backward and looking up, until the children had once more finished the verse, laughing and clapping. Evidently the applause for themselves was not enough this time, for there was no encore.

Peter, his eye on Uncle Henry, flopped down on his back and began gazing upward, too. In a moment he called,

"Uncle Hen?"

"Yes, Pete," from the dock, where Uncle Henry was star-gazing in the opposite direction.

"Why do they call 'the big dipper' the 'great bear'—and *is* there any 'little dipper'? Betty says there isn't, 'cause she never saw it."

Uncle Henry stepped off the dock upon the smooth sand, kneeled down, and without answering began collecting little smooth pebbles.

Peter sat up and asked in surprise,

"Don't *you* know, Uncle Hen?"

Surely this genius, who could make new kinds of

kites, and willow-whistles that "worked fine," was not going to fail now. The other children turned to him, expectant too. Betty herself was willing to be proved wrong about the existence of the "little dipper," rather than admit a limit to Uncle Henry's wisdom.

"Let's make a nice, smooth place on the sand," said Uncle Henry, his hands now full of those mysterious pebbles. These he put into his pocket and began, on all fours, to smooth sand industriously.

"Come on, youngsters," he invited, "and I'll let you settle the questions yourselves. We'll make a game of it," he added.

The trio breathed easier. Uncle Henry *did* know, and was going to tell—in a new, interesting way. Three pairs of hands started smoothing sand, with some waste of energy, but with rapid results.

"Now," said Uncle Henry, squatting down before the leveled place, and pouring out the pebbles in a little pile, "how many stones do you need to make the dipper, Pete? We'll draw it on the sand, with pebbles for stars."

Three necks craned upward in unison, and the two boys' voices answered, almost together,

"Seven."

Betty gazed a moment longer, and said,

"Eight."

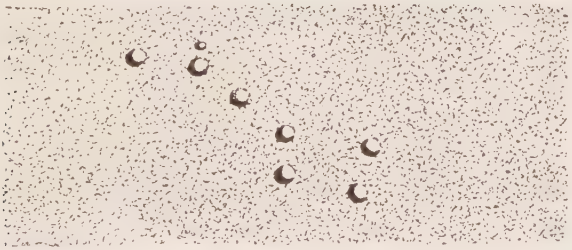
Uncle Henry looked interested.

"Where do you see the eighth, Betty?" he asked.

"Right close where the handle bends," announced Betty.

"Correct," said Uncle Henry, "that shows you have good eyes. The Arabs used to call that little star 'the proof,' because it is a test of good eyesight to see it. The star at the bend of the handle is also called 'the horse,' and that faint little star over it 'the rider.' You can make the dipper itself with seven pebbles, though. Go ahead and do it, Peter," Uncle Henry finished, "and take good-sized stones, to show that they're bright stars."

When Peter had finished, the smooth patch of sand looked like this in the light from Uncle Henry's pocket electric torch.

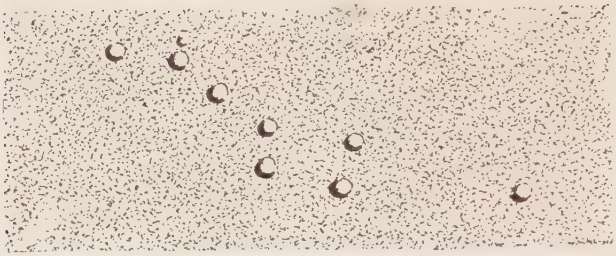


Betty insisted upon adding a tiny stone above "the horse," to represent her discovery, "the rider."

"Now," said Uncle Henry, looking upward, "I'll help you this much in finding all of 'the great bear.' The handle of the dipper is his tail. Everybody try to find the rest of him. Put down a pebble in the right spot for every star; big ones for bright ones, and little stones for faint ones."

"Ooh," interrupted Betty, "I got his nose!"

Here is where Betty put it.

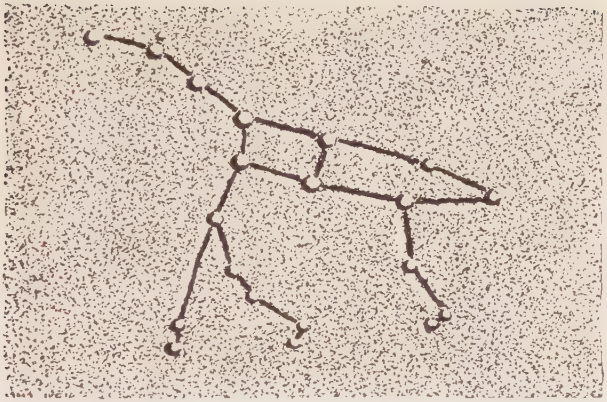


"—and his shoulders!" she added in a moment, putting them in with small pebbles.

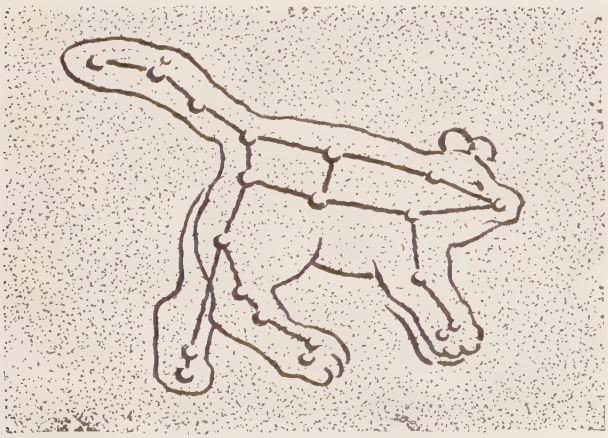
"I got his front leg!" announced Paul excitedly, adding three pebbles rapidly.

Then the bear looked like this.

It was Peter who contributed his hind legs and his "skeleton," made of finger-drawn lines in the sand. Like this.



And when Uncle Henry had drawn an outline in the sand with his finger, the "great bear" was done to everybody's satisfaction.



While they were all looking at it, Uncle Henry recited,

> "*Ursa Major* 's Latin—
> And it means, 'the greater bear.'
> *Ursa* 's 'bear,' and *Major* 's 'bigger,'
> If you want to see his 'figger,'
> At the dipper's handle stare—
> That's the tail of *Ursa Major.*
> Find his shoulders, nose, and toes—
> Who first named him, no one knows."

"Did you say, 'Noah'—or 'no one,' Uncle Henry?" asked Betty.

"I said, 'no one,' but have it 'Noah' if you like," said Uncle Henry. "Maybe Noah named him. He was interested in animals, and Adam ought not to have the only right to name them."

"Now let's find the little dipper!" urged Peter, anxious for a victory over Betty's doubts of its existence.

"When we find it," announced Uncle Henry solemnly, "it won't be a dipper at all; it will be another bear—a little bear. You know that Noah had two of everything in his ark."

"I told you there wasn't any little dipper!" shrilled Betty at Peter.

"Uncle Henry said we'd find it, though," countered Peter, looking hopefully at the oracle.

"So we will," laughed Uncle Henry, "the little dipper and the little bear are the same thing!"

"Come on!" urged Paul, "how do we start, Uncle Henry?"

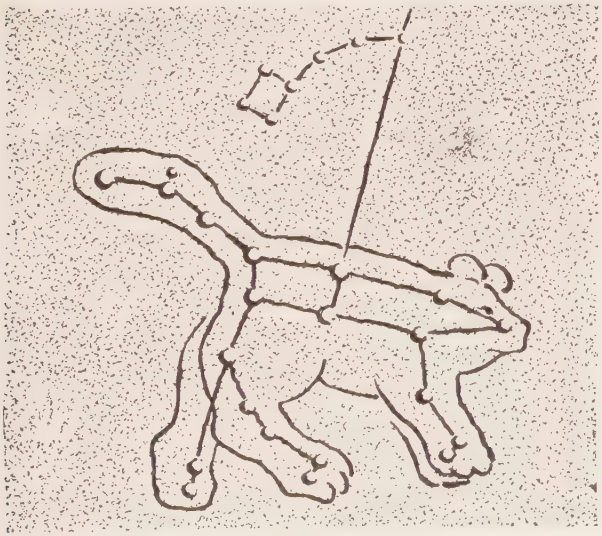
Uncle Henry got up on his knees and drew a long straight line in the sand with his forefinger. (1) It went up through both stars in the middle of the great bear's body, and a long way beyond. Over three times the distance between the two stars the line went beyond them. Uncle Henry put down a fair-sized pebble at the end.

"There," he said, "is the tip of the little bear's tail. Go ahead and find him; but I warn you—it's a very long tail, and you'll have to imagine his legs and nose."

There was a moment's silence. Then Peter said,

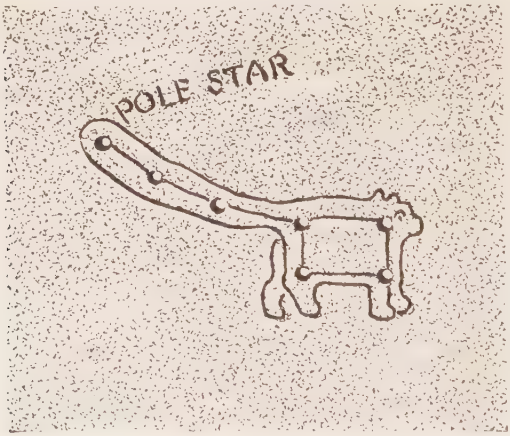
"I can't see any bear, but I *can* make out a dipper."

"Make it," said Uncle Henry.



When Peter finished putting down little pebbles the little dipper was very plain, just above the great bear's back.

Then Uncle Henry solemnly drew an outline around the seven small pebbles.



"Oooh, what a funny bear!" laughed Betty, when Uncle Henry's finger had finished. "His tail is so *long!*"

"Bears always have *short* tails," said Peter, looking reproachfully at Uncle Henry, as if that person was responsible. There was, however, a note of expectancy in Peter's voice. He expected a satisfactory explanation from Uncle Henry.

"This bear *once* had as short a tail as any other bear," said Uncle Henry, quite undisturbed.

"Who stretched it?" inquired Paul breathlessly.

"You will note," began Uncle Henry, "that the

tip of the little bear's tail is a star that is right at the top of the North Pole. You can't *see* the pole, but it's there—and long ago somebody tied the tip of the little bear's tail fast to it. As the earth turned around year after year, and the pole turned with it, the little bear was swung round and round by his tail. That would make anybody's tail stretch, wouldn't it?"

There was a moment's quiet. Then Peter said roguishly,

"You can't kid us into believing that, Uncle Hen—but we'll sure remember it."

All Uncle Henry said was,

"Your mother doesn't like you to talk slang, Peter."

Uncle Henry had scored again, and knew it.

"To-morrow night we'll find the dragon, and the man who drives the great bear around the pole, and his dogs, and maybe the lions and the swan," promised Uncle Henry, as he looked at his watch and stood up.

"Oooh, great!" cried the trio together.

"We'll have a reg'lar Noah's Ark on that sand, won't we?" said Betty.

"We'll call it 'Noah's Ark in the Sky,'" Uncle Henry agreed, as the children followed him up the walk to Seven Oaks Cottage.

SECOND EVENING

THE HERDSMAN'S DOGS CHASE URSA MAJOR—AND THE TERRIBLE DRAGON WRIGGLES AWAY IN FRIGHT

THE next evening Peter, Paul, and Betty were all down on the beach as soon as supper was over.

Peter and Paul had that morning made a fence of laths around the sand drawings of the two bears—big, and little, so that "Rags," their Airedale puppy, could not spoil them.

Now that "Rags" was asleep under the cottage, Peter and Paul removed the fence and smoothed the sand carefully for several yards around the bears, while Betty collected a quite unnecessarily large number of pebbles to represent the stars that would be found, with Uncle Henry's help, when the twilight faded.

When all this was done the trio sat down beside the smoothed space and called to Uncle Henry, on the porch, that one star was already out and he had better hurry.

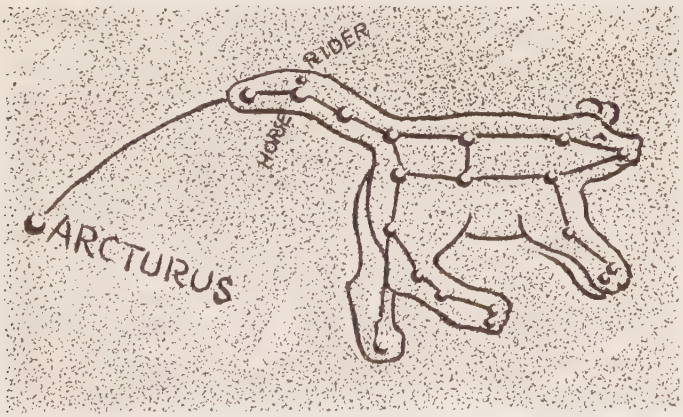
"I'll come when you can see *Ursa Major's* tail," called back Uncle Henry, and the children had to wait, although they shrilly announced each new star that glowed into sight in the darkening sky, and repeatedly urged Uncle Henry to "come on and begin!"

The seven stars of the big dipper were all plainly

visible when Uncle Henry came down the board walk and sat cross-legged on the sand.

The first thing he did was to extend the line joining the last two pebbles in the great bear's tail until it was about five times as long as before, and curved slightly downward as it went. (2)

"Now, Betty," he said, "give me a pebble—a good big one. This is a bright star we'll begin with; see if you can find it," and Uncle Henry put down the pebble at the end of the line, like this.



The three exclaimed, "I see it!" almost together.

"All right, then, we'll find '*Boötes*,' the herdsman who drives *Ursa Major* round the pole," said Uncle Henry. "He has two dogs to help him besides. We'll find them too."

The children gazed upward for some time, intently silent.

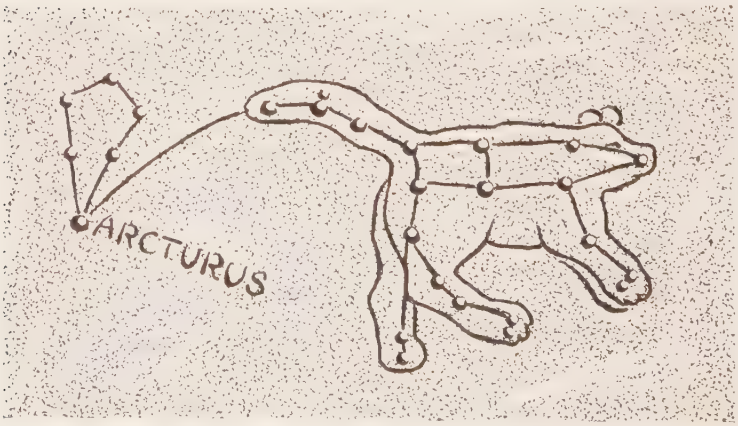
"I guess," observed Betty finally, "that you'll have to tell us whether that big star is the bear-driver's head—or one of his 'booties,' Uncle Henry."

A duet of groans from Peter and Paul followed this example of the lowest form of wit.

"I can't see anything that looks like a man the least bit," she went on, oblivious of the groans, "but I can see a kite, with that big star at the place where the tail would be fastened on."

"Fine," said Uncle Henry, "Make the kite then, Betty—and then we'll find the herdsman after we've flown the kite a while. That's the wonderful thing about Starland. If you get tired of one of the beasts or people in it—presto! You can change him into anything he looks like to you. *Boötes* is really much more like a kite than a man, so let's make the kite. Put the pebbles down, Betty."

Betty did, and they looked like this.



"That was easy!" exclaimed Peter.

"Never you mind, Mr. Peter!" Betty burst out warmly, "I found it first, anyhow!"

"We'll let Peter find the bear-driver's head," said Uncle Henry judicially.

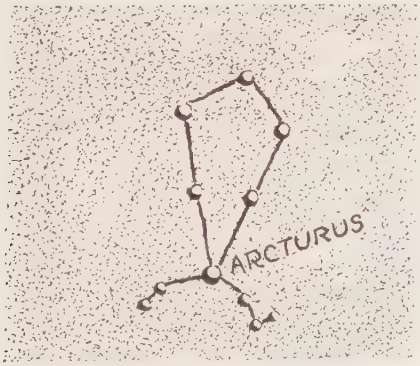
Peter promptly picked the big star at the tail-end of the kite.

"You're wrong," said Uncle Henry, "but I don't blame you. *Arcturus* is much too bright and beautiful to be only a big, bright button on the lower edge of *Boötes'* shepherd's kilt—but that is all it is. The star at the top end of the kite is his head, and the two stars at the ends of the cross-stick of the kite are his shoulders. About halfway from them to *Arcturus* you can find the belt of his kilt, and——"

"Oh, I see his legs!" interrupted Paul. "He's running after the big bear."

"Put them in, Paul," said Uncle Henry.

Paul did, and the figure of *Boötes* grew to look like this.



"But he hasn't any arms!" said Peter.

"Yes, he has," explained Uncle Henry, "his left one is up in the air, and his right one holds a shepherd's crook upon his right shoulder. Like this."

Uncle Henry added pebbles and lines until *Boötes* was finished.

"What awful short legs he has!" criticised Betty.

"That must be why he's never caught the great bear," smiled Uncle Henry.

"What's he shaking his fist for?" inquired Paul, pointing to the herdsman's left hand. "Is he so mad because he can't catch *Ursa Major?*"

Uncle Henry did not reply, but drew two long lines from the uplifted hand downward to a point just below the end of the big bear's tail.

"Oh, I know!" piped Betty, and throwing herself on her back, she began to star-gaze industriously.

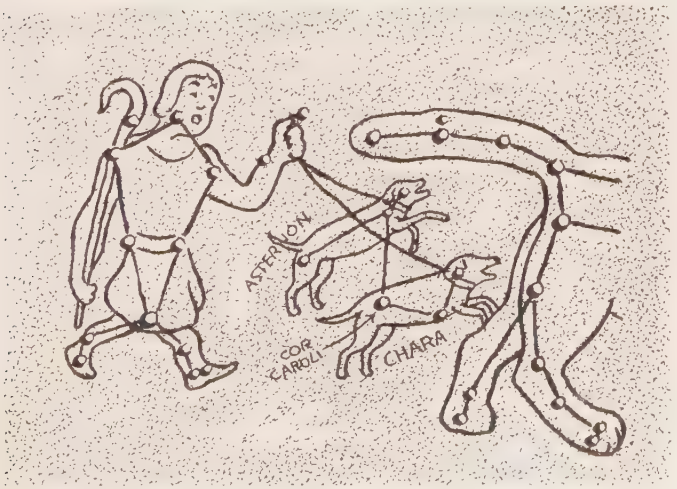
Peter and Paul looked at each other inquiringly.

"The dogs!" said Peter. "Betty's looking for them. They're on leash of course. Those lines are the leashes."

Uncle Henry smiled his pleasure.

"The hunting dogs—or, as you would say it in Latin, *Canes Venatici*, are largely imaginary. There are six stars—three in each dog, and all faint except one, named *Cor Caroli*."

"I see the bright one!" said Peter, and put down a fair-sized pebble to represent it. When the children had found the five other faint stars and Uncle Henry had finished drawing the dogs, *Boötes* and his hunting hounds, *Asterion* and *Chara*, looked like this.



"Why do they call the bright star at the tail of *Chara*, *Cor Caroli*, Uncle Henry?" asked Paul.

"It is Latin for 'heart of Charles,'" said Uncle Henry, "and the Charles they mean is Charles the Second of England, but don't ask me why, for I don't know. Perhaps the dog *Chara* ran away with *Cor Caroli*. I understand that Charles the Second lost his heart pretty often, and perhaps one time he didn't get it back. Beware, Paul! I am Father William out of Alice in Wonderland; 'you have asked me three questions and that is enough.'"

"Are you going to make a poem for us to-night, too?" inquired Betty hopefully.

"Let me see," said Uncle Henry thoughtfully. "Great bear, *Boötes*, pronounced Bō-ō-tees, and two dogs—they ought to make some kind of a poem. How's this? I'll let you name it after you've heard it."

"The big bear runs, the herdsman runs,
His dogs, they both are chasing.

While Ursa growls, Boötes howls,
His dogs, they both are barking.

For Ursa stole Boötes' bowl
Of hot milk, set acooling.

His mouth burns yet, the bowl's upset,
The milky way is streaming."

"The milky way to catch a bear," suggested Paul, as a name for the poem.

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"Who spilt the milk?" volunteered Peter.

"The herdsman hasn't ever caught *Ursa Major*," said Betty reflectively, "so he's wasting his time chasing him. 'Don't cry over spilt milk' would be a good title, I think. He ought to be tending his silly sheep, if he has any."

"I've got it!" exclaimed Peter, 'Ursa was a big bear; Ursa was a thief.' Like 'Taffy the Welshman,' you know."

Since no one else had a better title, the "Society of Star-Gazers," as Paul had named it, let it go at that, and allowed Boötes to persist in his pursuit of the great bear for his ancient mischief.

"I thought you were going to show us the lions to-night, Uncle Hen," said Peter.

"So I am, Peter," said Uncle Henry. "Tell me what you see just below and between *Ursa Major's* hind feet."

All the children looked, and Peter answered,

"Three faint stars, like a triangle."

"Put them in with pebbles," said Uncle Henry, and Peter did.

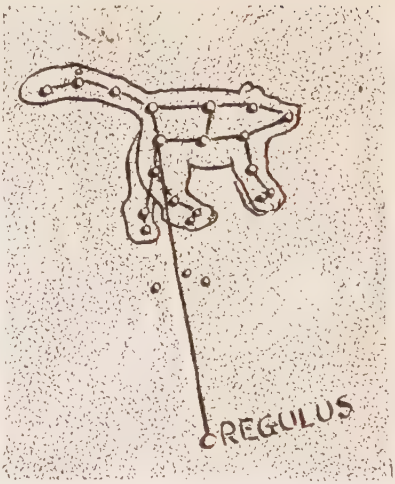
"That's one lion; the little one. Now we'll find the big one and draw them both."

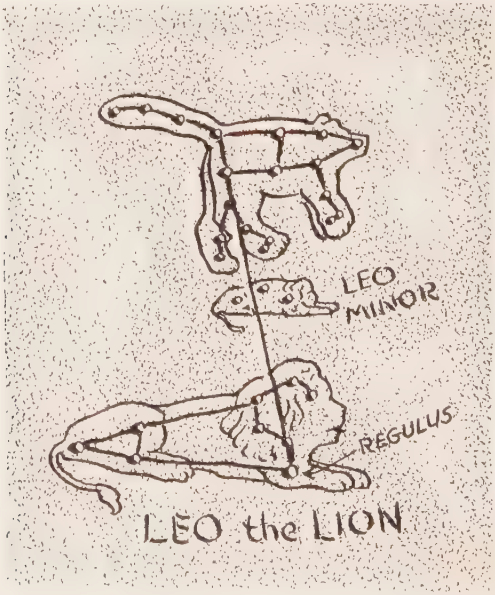
Then Uncle Henry drew a long line through the two stars at the root of the great bear's tail, and extended it to the three little pebbles in a triangle under the bear's feet, and through the triangle, and beyond as far again. At the end of this line he put a large pebble. (3)

"There," said Uncle Henry, "is the star *Regulus*,

which is in the big lion's heart. See if you can find the rest of him."

Betty soon picked out the lion's head, and Paul added his hind quarters, and when Uncle Henry had drawn outlines around both big and little lions they looked like this.





"Now show us the Swan," urged Peter.

"Yes, and the Dragon!" reminded Paul.

"You children haven't forgotten a single one I promised," laughed Uncle Henry. "Well, here goes; everybody find the dipper again."

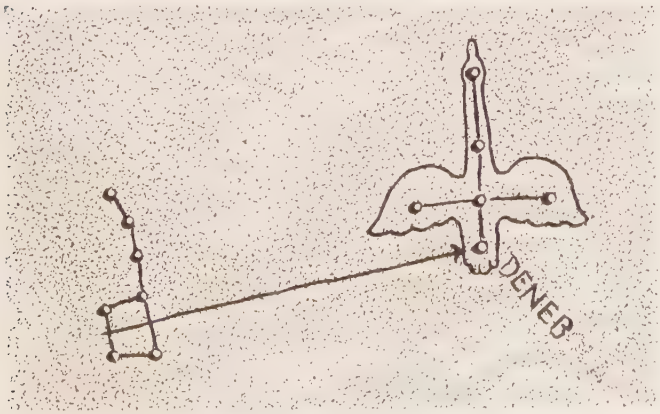
Everybody did.

"Now draw a line straight up through the middle of the dipper's bowl and keep on with it a little over three times the length of the dipper's handle. (4) Put a large pebble there and see if you can find the star. It's in the swan's tail, and he looks as if he was flying overhead, with his wings spread, and his long neck stretched out ahead of him."

"Is he sort of like a cross?" inquired Betty after a moment.

"Right," said Uncle Henry. "Put him in with pebbles."

This shows how to find and draw the swan the way the children and Uncle Henry did.



"Now the dragon, Uncle Hen!" urged Peter.

"Are you sure," said Uncle Henry, "that you promise not to have any bad dreams about the dragon if I show him to you before you go to bed?"

"Sure!" chorused the Society of Star-Gazers.

"Well," said Uncle Henry, "the dragon is very terrible, but he is afraid of bears, so he is squirming away as fast as he can from them. He is wriggling a little faster too, because *Ursa Major* is on one side of him and *Ursa Minor* on the other. Draw a line through the stars in the tips of the swan's wings, back toward the head of the bear-driver, and you'll find the dragon's head about halfway. (5) It's a little triangle of stars, and from that the dragon's body winds around the little bear's body and down above the big bear's back."

"I see all of him!" exclaimed Paul.

"Here are the pebbles," said Uncle Henry, "put the dragon, or *Draco*, where he belongs."

Paul did, and Uncle Henry finished him.

"To-morrow night," said Uncle Henry, "we'll find some more of the star people and sky animals. They even have musical instruments in this Skyland of ours, so we'll find the lyre that the sky ladies play on! One of the sky gentlemen is a great archer, too, so we'll find him shooting his bow and arrow at a giant scorpion, and——"

"Oh, let's find *that* now!" pleaded Peter and Paul in unison.

Betty did not join in the chorus. She was asleep, with her head in Uncle Henry's lap.

"To-morrow night," smiled Uncle Henry. "Betty will want to hear, too, about the sky lady's mandolin, or harp, or lyre, or whatever it is."

Then he picked up the little girl without waking her, and the boys followed him up the walk into "Seven Oaks"—and bed.

THIRD EVENING

UNCLE HENRY'S MAGIC TURNS THE LYRE INTO A UKELELE—AND THE ARCHER'S ARROW MISSES THE LOVELY SWAN AND HITS THE HORRID SCORPION

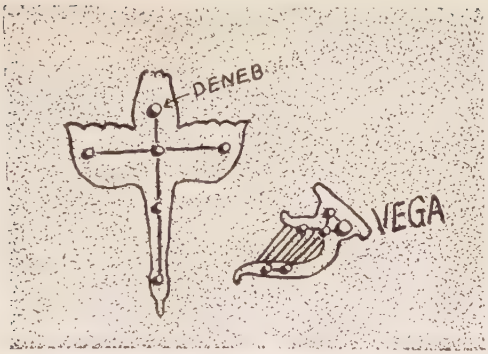
BETTY had been informed by her brothers that Uncle Henry had promised, after she fell asleep, to show the lyre that the star ladies play when they have nothing else to do.

Since she had a new ukelele herself, and was learning to play it, her interest in all stringed instruments was keen, and as soon as the Society of Star-Gazers had come together on the beach the next evening, she demanded that the lyre be found.

"All right," said Uncle Henry, "find the swan's wing, on the side of him toward the dragon. Get that? Well then, look for a very bright star between that wing and the swan's neck, and about the length of the swan's neck away from the tip of the wing. You can't miss it, for it's the brightest star anywhere near. Its name is *Vega*, and some one has called it 'the arc-light of the sky.'" (6)

"I see it!" cried Betty and the boys together.

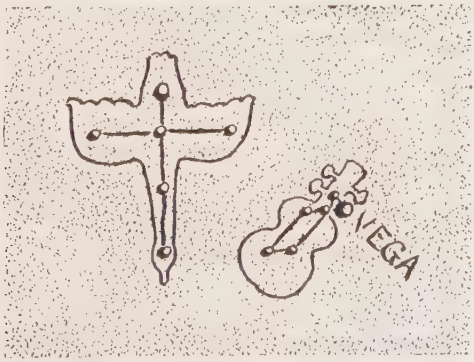
"Look for two smaller stars that make a triangle with *Vega*, and then for three more that make a long diamond shape. That's right, Peter, put down the pebbles and finish the lyre."



"It's sort of a harp on a foot!" said Betty in disappointment. "I want to make a ukelele of it."

"Sure, easy as breathing," agreed Uncle Henry, and promptly rubbed out *Lyra* from the sand, and made it over.

After all, Betty was the baby and might have her own way whenever Uncle Henry had anything to say about it. And let no one say that the ancients had all the imagination, after seeing the ukelele that Uncle Henry made of *Lyra.*



"We strive to please," he said as it was finished, and Betty clapped her hands.

"Now we want to see the archer shoot the giant scorpion!" demanded Paul, speaking for the masculine part of the audience.

"Just a minute," said Uncle Henry, "I'm coming to him. You can see one of his arrows if you look on the other side of the swan's neck, just opposite to Betty's ukelele. The archer shot at the swan and missed it."

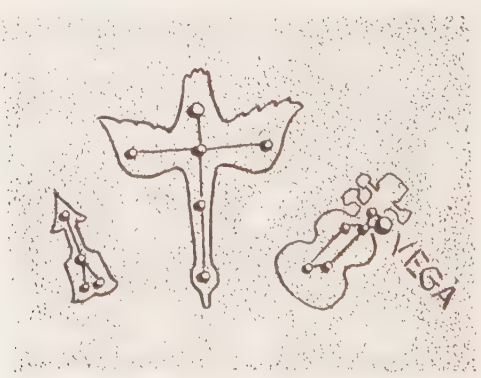
"Serves him right for trying to kill the beautiful swan. I love 'em!' said Betty, with feeling.

"You'll need to use very small pebbles," warned Uncle Henry, "for *Sagitta* is rather small and quite faint."

"What's *Sagitta?*" asked Peter.

"Latin for 'arrow,'" said Uncle Henry.

When the arrow was found and drawn, it was in this position.



"Now the archer!" demanded Paul.

"All right," said Uncle Henry. "Paul, draw a line straight out from the head of the swan, right on in the direction he is flying, and go about twice the length of the swan's neck." (7)

Paul did.

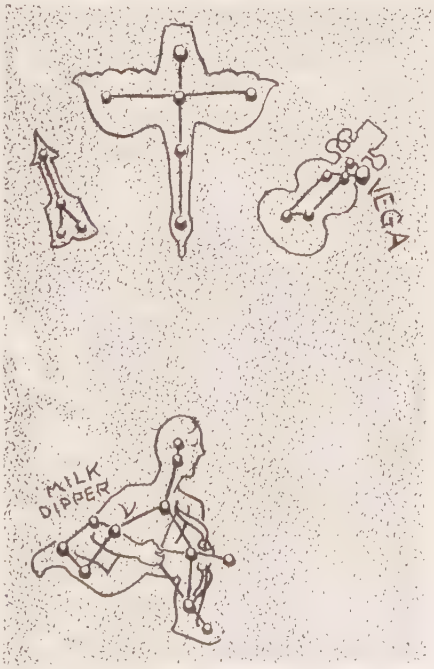
"Now tell me," asked Uncle Henry, "does anybody see anything, about there, that looks like a bow and arrow?"

The children searched the sky at a point a little over two swan's necks ahead of the swan's bill, and Peter cried triumphantly,

"I see it! I see it!"

"Make it then," said Uncle Henry, "and keep the bow in the right position to the swan's neck."

When Peter had all the pebbles in their right positions, Uncle Henry drew in the archer's body, and bow and arrow, and they looked like this:



"He's just getting ready to shoot at the scorpion!" exclaimed Paul.

"Yes," said Uncle Henry, "and the other star people have to look out too. The people who lived long ago called *Sagittarius*, our archer, "the Bull Killer." They did this because when the stars of the archer rise in the east, they seem to drive all the stars of *Taurus*, the Bull, over the western edge of the world. So they said that *Sagittarius* killed off the Bull. We'll find *Taurus* next winter."

"Now let's find the scorpion," urged Peter.

"Wait a minute!" begged Betty, "I see another dipper."

Peter was impatient. Dippers were not interesting, compared with giant scorpions.

"Betty," he remarked, "wouldn't believe there *was* a little dipper a few nights ago, and now she's seeing 'em everywhere."

But Betty had her way as usual, and the Society of Star-Gazers paused before passing on to the scorpion.

"Where do you see the new dipper, Betty?" Uncle Henry inquired with interest.

"It's right back of the leg the archer is kneeling on." (8)

"You're quite right," Uncle Henry agreed, "and it's called 'the milk dipper,' because it's right on the edge of the milky way."

"Why that's the bowl *Ursa Major* tried to get *Boötes*' hot milk out of, and burned his mouth, and upset!" explained Betty, with a sudden inspiration.

"So it is," agreed Uncle Henry, "although I must

confess I never thought of the milk dipper when I made up that rhyme for you youngsters."

"Now the scorpion!" insisted Peter.

"Oh, have your old scorpion, then, Mr. Peter!" exploded Betty, "I don't want to see the horrid thing. I'm going to the cottage and show Katy the milk dipper."

And she went.

So it was with Peter and Paul alone that Uncle Henry found the scorpion that *Sagittarius*, the archer, is always aiming at. (9) It would have been easy for Betty to find, for it really looks a good deal like a scorpion. See if you don't think so when you've found it.

After Uncle Henry had shown the boys how the big, red star, called *Antares*, in the heart of the scorpion, has a reddish color, Peter suggested that it was probably red because the Archer had already shot an arrow through the scorpion's heart, and made it bleed.

After that, since neither the boys nor Uncle Henry ever wanted Betty left out of anything, and since they knew she would have stayed if Peter and she hadn't wanted different things at the same time, the Society of Star-Gazers adjourned until the next evening.

On the porch, however, Uncle Henry made up this poem and repeated it to Peter and Paul before they went in to bed.

"The Scorpion's heart has bled,
Antares-star is red,
The Archer made an arrow-wound,
But Scorpio isn't dead.

The Archer draws his strong-bow,
To shoot a sharp new arrow.
I hope he hits the Scorpion,
And kills the poisonous fellow."

FOURTH EVENING

THE VIRGIN IS TOO BUSY FEEDING HER SKY POULTRY, SO CASSIOPEIA GETS THE UKELELE TO PLAY

BETTY, in spite of her pretended lack of curiosity about the scorpion, was down on the beach the next evening ahead of the other members of the Society of Star-Gazers. Uncle Henry found her in the twilight, sitting cross-legged before the sand-drawing of *Scorpio*.

As she searched the southern sky to find the constellation, she was singing Uncle Henry's verses about the archer and *Scorpio* over and over, to a tune of her own improvising.

The boys had made bows and arrows from green saplings during the morning and had raced about for some time with "Rags," in search of giant scorpions to shoot at. They discovered them in the most unexpected objects—trees, rocks, and even boats. The hunt had been accompanied by a war chant, with the scorpion verses for words. It was a faint echo of this that Betty was crooning to herself now.

As Uncle Henry approached her she looked up at him and said,

"Aren't there any ladies among the star people, Uncle Henry? You told about the lyre that they play on, but you haven't shown any of them to us."

"Well, Betty," said Uncle Henry, sitting down beside her, "there are several ladies in our star country, but only two of them are in our sight in the summer time. Let's get the boys and we'll find both the ladies and take a vote to decide which of them shall have your lyre-ukelele to play on."

Betty called, in her high little voice, for Peter and Paul to hurry, and they raced down from the porch with "Rags" in tow.

"Uncle Hen," asked Peter, "'Rags' wants to know if there aren't any more dogs in the sky?"

"Sure," said Uncle Henry, "sky folks are very fond of dogs. We've found the two that belong to the herdsman. Besides them, there are two others, but we can't see them 'til next winter. And, of course, there's *Cerberus*, the ugly, monstrous three-headed dog that Hercules killed. We'll find him to-night."

"Oh, that's great!" said Peter, and he and Paul settled down with "Rags" between them. "Rags" looked expectantly at Uncle Henry, who said,

"But first I've promised Betty to find the sky ladies that we can see now, and let one of them have the ukelele."

"Rags'" ears dropped and he lost interest. Peter and Paul, however, remembering Betty's temper of the previous evening, said,

"Of course, ladies first."

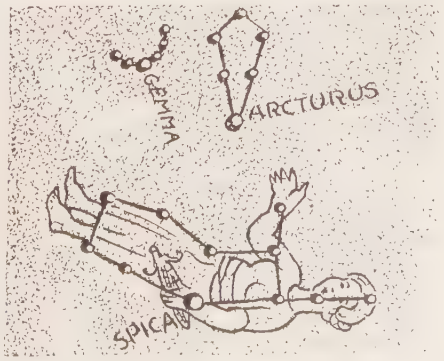
"All right," said Uncle Henry, "everybody find *Arcturus* in the hem of *Boötes*' kilt. Get that? Well, then, draw a line in the sand, Betty, from *Boötes*' right shoulder through *Arcturus*, and extend the line

about as far again. (10) Then look in the sky at that point for a bright star.

"I see it!" cried Betty. The boys picked it out next moment.

"Well," said Uncle Henry, "it doesn't look much like an ear of corn, does it? That's what it is, though; an ear of corn held in the Virgin's left hand. Its name, *Spica*, means just that. The Virgin is scattering grains from the ear of corn with her right hand, to attract the birds of Starland—the swan, the eagle, and the dove. We'll find the eagle a little later on, but the dove is so far south that we never see it well. The boys and girls in South America see Noah's dove, but we can't."

"Now," continued Uncle Henry, "follow along northward from *Spica* to a point just below the big lion's tail. There is the Virgin's head. Between it and *Spica* are two fairly bright stars. The one nearest *Spica* is the Virgin's shoulder. Her left arm hangs at her side, from the shoulder to *Spica*, while her right arm extends in the direction of the great bear's tail. Put down the pebbles as fast as you find the stars, Betty."



When Betty and Uncle Henry had finished the Virgin, or *Virgo*, as she is called in Latin, she looked like this:

Then Uncle Henry added the little half circle of small pebbles, with one larger one near the centre, shown in the picture just at the left of Boötes. (11)

"What is that, Uncle Henry?" asked all the children at once.

"Do you see it in the sky?" he asked.

The children quickly found it.

"What does it look like, then?"

Peter thought it was a handful of corn-grains from *Virgo*'s hand.

Betty said, "A necklace."

"That's nearest right," said Uncle Henry. "It is called *Corona Borealis*, or the Northern Crown. That brightest star is named *Gemma*, so you see it might be a gem in a necklace, too. The Virgin looks as if she was going to bend over and pick it up. Perhaps she will some day."

"I think," said Paul, "that she's too busy a person to give Betty's ukelele to. Who's the other lady?"

"I quite agree with you," said Uncle Henry. "The Virgin seems very much occupied. Well, there is another lady in Starland. Her name is *Cassiopeia*, and since she has nothing to do but sit in a chair, perhaps Betty will let *Cassiopeia* have the ukelele to play. *Virgo* won't be jealous, either, because she is clear across the sky from *Cassiopeia;* too far away to see. A long line drawn across the sky from *Spica* through the pole star in the little bear's tail-tip will reach *Cassiopeia.* (12)

"She is easy to find, because she looks just like a big letter W. Does anybody see it?"

The trio all found the W very quickly. You will, too, for it is very conspicuous in the northeastern sky in July and August. Uncle Henry showed the children that *Cassiopeia's* W had to be turned upside down, into an M, before she could be made to sit in her chair properly.

Here is how *Cassiopeia* looked:

"She hasn't a blessed thing to do. We'll give the lyre to her," said Betty.

"I am glad to hear that you are going to give the ukelele to *Cassiopeia*," said Uncle Henry. "Perhaps it will make her feel happier. She has had a rather sad life. Long ago *Cassiopeia* was queen of *Æthiopia*, and was very beautiful. But she was so proud of her good looks that she boasted herself prettier than the lovely sea-nymphs. This made Neptune, the god of the sea, so angry that he sent one of his worst sea-monsters to make trouble along the shore of *Cassiopeia's* country.

"And as if that wasn't bad enough, Neptune

demanded *Cassiopeia's* daughter *Andromeda* as a sacrifice.

"So you see it seems good to see *Cassiopeia* getting a little justice done her, if it's only the present of a ukelele."

"Teacher says," piped up Betty, "that the lady's statue on top of the Court House is '*Justice.*' What does she have that little pair of scales in her hand for, Uncle Henry?"

"The scales are to help her in weighing the good and bad that people do," explained Uncle Henry, "and speaking of scales, there's a pair of them in the sky, too. If you will look between the *Scorpio* and the Virgin you will find the scales. (13) They are called *Libra*, which is Latin for 'balance.' There are four main stars in *Libra*, which make an oblong."

This is how *Libra*, the balance, looked when the children and Uncle Henry had finished drawing it:

"Now," said Peter, with an air of having shown great patience, "we want to see that three-headed dog. I forgot his name."

"*Cerberus*," said Uncle Henry, "But in order to find him we'll have to find *Hercules*, the great strong man, for *Hercules* has *Cerberus* fast by one of his throats and is beating at his three ugly heads with a big club. At the same time, *Hercules* has his left foot on the dragon's head, so you see he is kept busy."

"Where do we begin?" asked Paul, impatiently.

"Draw a line," said Uncle Henry, "from *Vega* in the ukelele to *Gemma* in the *Northern Crown;* the Virgin's necklace we found a while ago, you know."

Paul did it. (14)

"Now," directed Uncle Henry, "look about half-way between, and you'll find *Hercules*' legs. His left leg is nearly straight, but his right has the knee bent a little. *Hercules*' legs and the sides of his body and his belt make sort of an H shape.

"Oh, I see it!" exclaimed Peter. "Shall I make him, Uncle Hen?"

"Sure, go ahead, Pete; and the rest of you watch for *Hercules*' head and arms."

When the children had put down pebbles to represent all the stars in *Hercules*, and had connected them with lines in the sand, *Hercules* looked like this:

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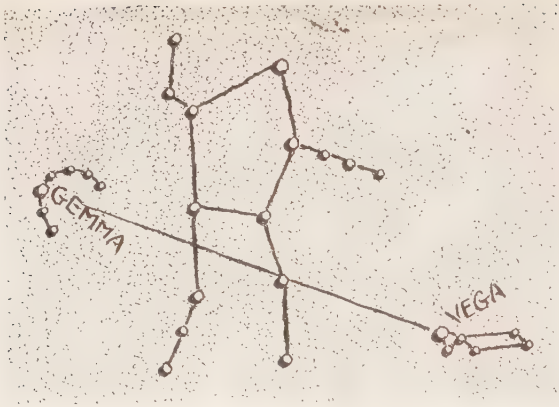
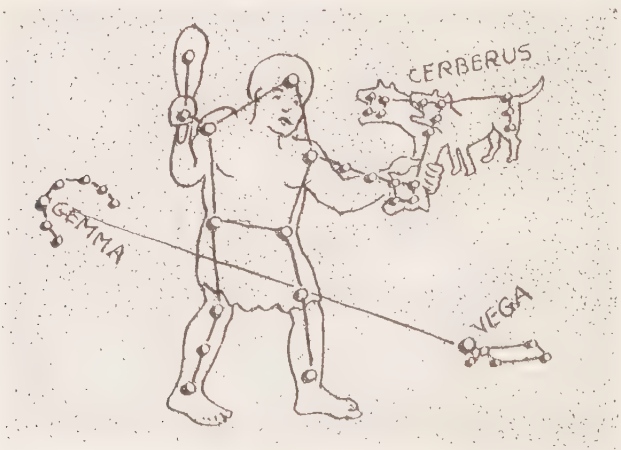


"Oh," broke out Betty, excitedly, "he's got the ugly dog in his left hand!"

Then she added the three heads of *Cerberus*, and it was Uncle Henry's turn to draw in the outline of *Hercules*, and complete the picture, like this:



"You have probably read," said Uncle Henry, "about the twelve great labors *Hercules* performed. He had to be very strong to do them, but of course he was born that way. They say he even rose up out of his cradle and strangled two serpents that the goddess *Juno* sent to destroy him."

The Society of Star-Gazers became very enthusiastic about *Hercules* after he was all finished. So will you when you see how big and strong and beautiful he is, almost straight over your head in the summer sky just after dark. You will enjoy him more if you lie on your back to look, as the Society of Star-Gazers did on the beach.

While they were all flat on the sand, looking up into the great blue-black, star-sprinkled bowl, Uncle Henry made up this poem, and recited it before the Society adjourned for the night:

"Hercules the strong man—
Feel his muscle!
Feel his muscle!

Hercules the strong man—
See him tussle!
See him tussle!

Right hand holds a club—
I can see;
I can see.

Left hand grips a throat—
One of three;
One of three.

Three-head dogs are freaks—
Queer to us;
Queer to us.

That's because you never saw
Cerberus;
Cerberus.

FIFTH EVENING

IN WHICH A DOLPHIN WITH AN EAR FOR MUSIC SAVES A POET'S LIFE—AND UNCLE HENRY PUTS TWO BIRDS IN ONE POEM

DURING the next day Peter and Paul had seen a blue-racer in the grass, and, with Rags' assistance, had chased it off into the woods behind the cottage.

So it was only natural for Peter to ask Uncle Henry whether there were any snakes among the star creatures.

Uncle Henry had said, "Two," and promised to show the children a very big one, and an old man having a struggle with it besides.

Peter and Paul were expectantly waiting on the sand when Uncle Henry and Betty came down from the porch that evening after dark.

"Now," said Peter, "where's the snake, Uncle Hen?"

"We'll begin with his head," said Uncle Henry. "Everybody find the northern crown, or *Virgo's* necklace, and *Hercules'* club. Now look just between them and you will see five stars in a sort of little cross, quite close together. Get that?" (15)

The children soon found all five and put down little stones to represent them on the sand.

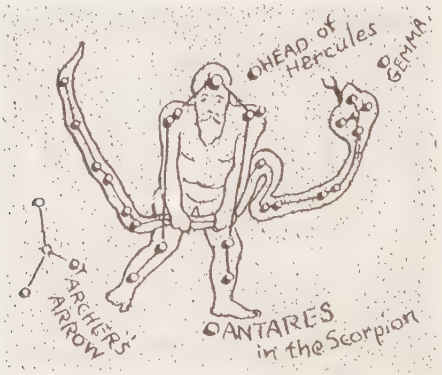
"All right, then; now trace a line from star to star, down toward *Scorpio*, and then across toward

the archer, and then up in the direction of the swan. That line is the *Serpent*. It is writhing in the hands of *Ophiuchus*, the old man who is called 'The Serpent-bearer.' His head and *Hercules*' head are only a little way apart. Look for a bright star just east of the bright one in the head of *Hercules* and you will have the head of *Ophiuchus*. Then look where his shoulders would naturally come and you will see two stars close together in each shoulder. Find them?"

The children did, and placed pebbles for the head and shoulders of *Ophiuchus*.

"Now," said Uncle Henry, "draw two long lines down from the shoulders, through the Serpent and beyond, and you will have the old man's body, legs and feet. One foot is just in front of the archer's bow; the other is just above the red heart of *Scorpio*. You will have to imagine his arms, and his hands holding the serpent while it squirms."

When all the pebbles were down and all the lines were drawn, *Orphiuchus* and the serpent, or *Serpens* in Latin, looked like this:



"Are there any more snakes, Uncle Hen?" inquired Paul expectantly.

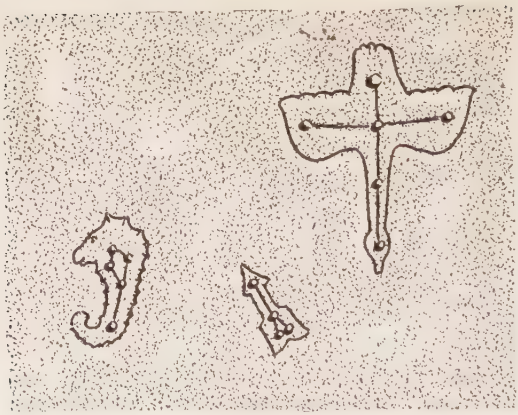
"Yes, a sea-serpent made of very faint stars," said Uncle Henry, "but he is rather hard to trace out and the only other creature I have left now that is anything like a snake is a dolphin, or porpoise, and he isn't much like one. We'll find him, anyway, and then if you prefer to make a sea-horse out of the dolphin, or *Delphinus*, as you would say in Latin, why go ahead and do it. The animals in Starland are very obliging. They will turn into anything you like to see in them.

"Where is the dolphin, Uncle Henry?" asked Betty.

"Well," said he, "draw a line through the beak of the swan and the arrow, or *Sagitta*, and it will strike *Delphinus*. (16) The arrow is about halfway between the swan and the dolphin. See it?"

The children soon found the dolphin and mapped his skeleton with pebbles. Then Uncle Henry put it to a vote of the Society of Star-Gazers whether *Delphinus* should be finished up as a dolphin or a sea-horse. The vote was two to one for the sea-horse.

Uncle Henry drew a sigh of relief; he didn't know quite what a dolphin looked like, and he had seen a picture of a sea-horse in the dictionary only the day before. So *Delphinus* turned out to look like this. If you insist on having him a dolphin, why draw him differently yourself:



"I wonder," said Betty thoughtfully, "who rides the sea-horses. Do the mermaids, Uncle Henry?"

"I don't know about the mermaids," he answered, "but I do know that an ancient poet and musician, named *Arion*, was saved from drowning by riding to shore on a dolphin. It was like this:

"Arion had gone from his home on the island of Lesbos to Italy, and while there had made a great deal of money by his singing."

"Just like Caruso in New York," exclaimed Paul.

"Yes," said Uncle Henry,"and also like Caruso, *Arion* decided to go home for a visit. Well, on the way to Lesbos the sailors decided to murder *Arion* and get all the money he was taking home with him. He had gone on a regular pirate ship you see. The pirates were all ready to kill *Arion*, but he begged so hard to play just one little melody on his lute before he died that the pirate sailors said, 'Yes, he might

play just one.' You would hardly believe it, but the melody that *Arion* played was so catchy and tuneful that it attracted a number of dolphins, who began to dance and turn somersaults about the ship. Then *Arion* watched his chance—and jumped overboard—and one of the friendly, music-loving dolphins carried him back to Lesbos on his back."

"My, but I'm glad he got away from those awful pirates!" cried Betty with heartfelt fervor.

"It's too bad the horrid sailors got his money after all," said Peter. "If they hadn't he might have got something nice for the dolphin to eat when he got to that place where he lived."

"The dolphin fared better than that," Uncle Henry assured the children. "It pleased the sea god *Neptune* so much to have one of his creatures save a poet's life that he had that dolphin put in the sky among the stars, and we see him there now as the constellation *Delphinus*."

"What's next?" demanded Peter when the story of *Delphinus* was finished.

"The next three," said Uncle Henry, shaking his head sadly, "are the last."

"The last?!!" chorused the Society of Star-Gazers incredulously.

"Well, maybe not absolutely the last," admitted Uncle Henry, "but the last for this Summer. There is a whole dozen more of the Star People in our northern sky, but we can't see them until next Winter."

"Why?" inquired Betty anxiously.

"It's a long story," said Uncle Henry. "Sometime I'll tell you all of it, beginning with the fact that the pole of the earth always points to the north star, where the little bear's tail is fastened, you remember. I promise to show you all the rest of the star animals and people when I come home for my Christmas vacation. Will that do, if I show you a wonderful eagle to-night—and a sea goat and a water carrier to finish up with?"

The children were disappointed, but they trusted Uncle Henry. He wouldn't stop showing animals and people until he had to; they all knew that.

Peter said,

"We'll have a whole dozen to look forward to next Christmas. Sort of a present from Uncle Henry. Come on, Uncle Hen, let's find the eagle and the sea goat and water carrier!"

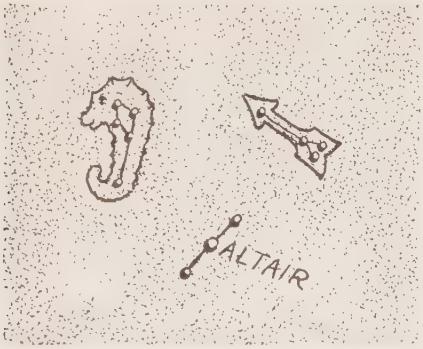
The others agreed with Peter.

"The eagle, or *Aquila*," said Uncle Henry, "is easy to find because of a very bright star, called *Altair*, which is right in his neck. You will find it near the arrow, or *Sagitta*, between the end of the serpent's tail and *Delphinus*. (17) Does anybody see *Altair?*"

"I do," said Betty, "it's right between two other stars that aren't so bright."

"Right," said Uncle Henry. "Put down pebbles to represent all three, Betty, and we'll find the rest of the eagle, or *Aquila*, as it would be in Latin."

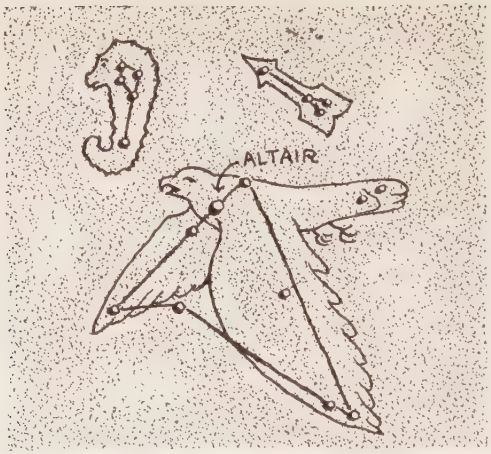
When the three pebbles were in place they stood in this relation to *Sagitta* and *Delphinus:*



"Now," said Uncle Henry, "draw a line downward through the three stars and a little more than twice as far again and what do you see?"

"Another star," said Paul.

"Put it in," said Uncle Henry, "and then draw another line from the upper of the first three stars in the direction of the handle of the 'milk dipper' in *Sagittarius*, the archer. Continue this about four times the length of the line that joins the first three stars together and you will find two fairly bright stars close together. That's right, Paul; put in the star you find about halfway down the line, too. Now draw a line from the two fairly bright stars back in the direction of the tail of the sea-horse, or *Delphinus*, until it almost meets the first line you drew. There you will find another fairly bright star. Now it is easy to finish the eagle's skeleton."



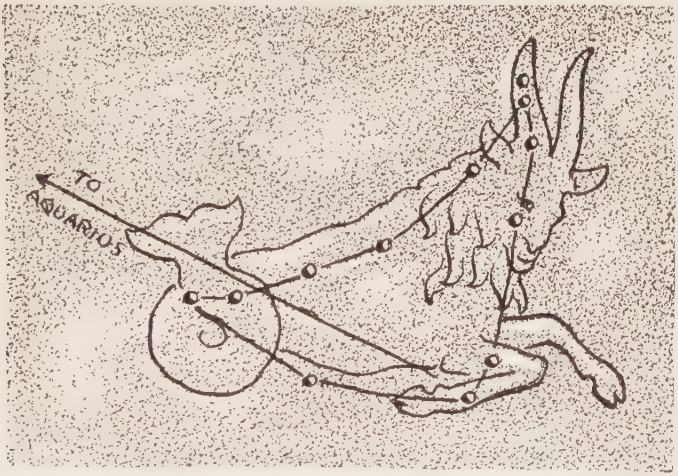
When the eagle's skeleton was finished Peter thought it looked more like a big arrowhead than an eagle, but when Uncle Henry had drawn the outline of *Aquila*, the Society of Star-Gazers admitted the resemblance to the bird.

"Now where's that sea goat?" inquired Peter.

"Follow the line of the first three stars we found in *Aquila* downward, and just a little way beyond where it ends in the tip of the eagle's wing you will see two rather faint stars, close together. (18) They are at one corner of a 'cocked hat' such as you make out of newspaper when you play soldier—sort of a Napoleon's hat. It is upside down. When you find it and put down pebbles for stars I'll show you how the good imaginations the ancient people had turned the cocked hat into a sea goat."

This shows how *Capricornus* the sea goat looked

when the children and Uncle Henry had finished him. I leave it to you to decide whether or not he looks more like a cocked hat.



"When we have found *Capricornus* the sea goat," said Uncle Henry, " it is easy to find *Aquarius* or the water carrier. Just prolong the line that connects the goat's right foot with his tail until it runs close to a little triangle of three stars with another in the centre. (19) It looks a little like the head of the Serpent we found squirming in *Ophiuchus*' hands, but it is the water-jar *Aquarius* is carrying."

"Oh, I see it," cried Paul.

The other stars in *Aquarius* were soon found and represented by pebbles. Then Uncle Henry drew

the outline that finished the Water-Carrier, like this:

"Now we're all through?" inquired Betty.

"Until next Christmas," smiled back Uncle Henry.

"Can't we have just one more poem?" teased Paul.

"What shall it be about?" asked Uncle Henry, with the air of a man who could write a poem to order on any subject.

"One about the lovely swan," commanded Betty, "you haven't made one up about the swan."

Uncle Henry was in a quandary; he wanted to please everybody with the last poem. He lay down on his back and looked up at the sky for so long that the children thought he must have fallen asleep.

Finally Uncle Henry began to recite,

"The eagle of Starland
Got tired of his tree,
And challenged the swan to a race.

"Come up from the water!
Fly up and be free!
To northward I'll beat you a chase.'

The swan thought of shivers
And icebergs and frost—
He made up his mind to race South.

So they are still flying—
Their race can't be lost—
Till Gabriel blows with his mouth."

"What'll Gabriel blow?" inquired Peter when the hand-clapping had stopped.

"His trumpet, of course, silly!" answered Betty for Uncle Henry.

Just then the children heard a toot from an automobile horn that they all recognized, and the Society of Star-Gazers raced with Uncle Henry back up to "Seven Oaks Cottage."

"Sister" and "the Children's Father" had come back from their trip and had surprised everybody.

The summer sessions of the Society were over.

FIRST WINTER EVENING

THE "SOCIETY" LEARNS WHY ORION NEEDS A CLUB TO KEEP FRISKY TAURUS IN ORDER—AND WHY WE SAY "BY JIMINI!" WHEN WE GET EXCITED

Uncle Henry came, as he had promised, to spend his Christmas holidays with "Sister," "the Children's Father," Peter, Paul and Betty, in their city apartment.

The children's hope for fair weather in Christmas week was not disappointed either. The days were snowy and sunny and the nights frosty and clear.

Only one thing had worried the "Society of Star-Gazers"—what was to take the place of the smooth sand of the beach when Uncle Henry should begin to point out the sky people that were visible in the winter sky? There were pebbles, it was true, on the flat roof of the apartment house, but there was no sand.

The children were certain, however, that Uncle Henry would find a way, as he always did, and sure enough, when he arrived he brought, as one of his Christmas gifts to the children, a wonderful blackboard, an easel to stand it upon, and plenty of white chalk.

After dinner on the first night of Uncle Henry's visit, the Society of Star-Gazers was bundled up in warm coats and mufflers and he led the way to the

roof, carrying the blackboard and his pocket electric flashlight.

Far above the lights of the city arched the great, blue-black bowl of the sky, filled with the sparkling patterns of stars that the children had learned to know as steadfast, unchanging friends.

"Uncle Henry," said Betty, "you've told us about enough animals to really fill a Noah's ark, but we've never heard anything about Noah himself. Isn't there any Mr. Noah in the sky?"

"Well, Betty," said Uncle Henry, "There isn't any constellation that's named for Noah, but he was a great hunter, and since there is a great hunter in the sky, we can call him Noah if we want to, even if his last name is *Orion*."

"Noah O'Ryan!" laughed Paul. "I know a boy named Michael O'Ryan."

"It's not the same spelling," said Uncle Henry, as he turned the flashlight on the blackboard while he wrote the word upon it, and underneath, made three large chalk dots, like this:

"Find those three stars," said Uncle Henry, "and you will have the *belt of Orion*. It ought not to be hard to find them, for there are no other stars like

them anywhere in the whole sky. Those three stars have always attracted a lot of attention from people in all times and countries. In the Bible Job calls them 'the bands of Orion'; the Arabs called them 'the Golden Nuts'; the fierce Masai Tribe in Africa call them 'the three old men'; the ancient Chinese named Orion 'Tsan, 'which means 'three'; and to the Eskimos these three stars appear to be the three steps that a Starland Eskimo cuts in a snowbank when he wants to climb to the top of it."

The children soon found *Orion's* belt about a third of the way up the southeastern sky.

"Now," said Uncle Henry, "see who can find his shoulders first. Here is a piece of chalk for each of you. Put the shoulders in as soon as you see them."

Paul found *Orion's* right shoulder, and Betty his left, and made large chalk dots to show how bright and beautiful the stars that mark the shoulders are.

"Oh, I see his f e e t!" exclaimed Betty delightedly.

"Put them in then," said Uncle Henry.

Then *Orion* looked like this on the blackboard:

"I'll tell you this much more," said Uncle Henry, "and then you must finish *Orion* by yourselves. He has a great club, raised, ready to strike, in his right hand, and he holds a lion's skin on his left arm, as a shield."

"What's he going to hit at?" inquired Peter, with his boy's joy in battle uppermost.

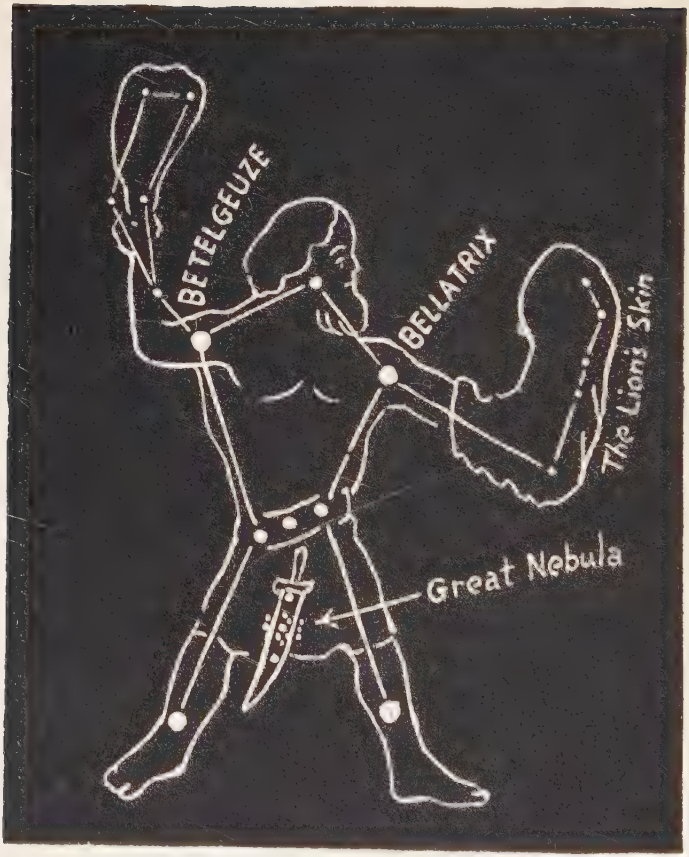
"At *Taurus*, the wild bull," said Uncle Henry. "You see that *Taurus* is very fierce, and would enjoy nothing better than to chase the twin star boys round and round the sky. He might not really want to hurt the boys, whose names are *Castor* and *Pollux*, but *Taurus*' horns are very sharp and he doesn't know how to play gently, so it keeps *Orion* pretty busy getting between him and *Gemini* and threatening the bull with his club."

"What's 'jimini,' Uncle Hen?" said Paul. "Sounds like our swear word."

"It *is* the origin of it," said Uncle Henry. "The ancient Romans used to swear 'by *Gemini*,' and it has slowly been changed into your 'jimini.' *Gemini* is the Latin word that means 'twins.' We'll find them after we finish up *Orion* and *Taurus*, and then you'll see just how *Orion* keeps protecting them from the bull."

"Hurry up, Uncle Hen!" urged Peter. "I'm dreadful excited!"

Uncle Henry did, and as a result *Orion* looked like this:


BETELGEUZE
BELLATRIX
The Lion's Skin
Great Nebula

"Ooh! he's got a sword, too!" cried Paul, as Uncle Henry added the three tiny stars below *Orion's* belt, and drew the outline around them.

"Why didn't he use the sword on *Taurus?*" asked Peter.

"Because he knew *Taurus* was only playing in his rough way," Uncle Henry replied.

"Well, we've heard a lot about that bull," said Betty. "Let's find him right away."

Uncle Henry said nothing, but took the chalk from Betty and drew a light line from *Orion's* right foot to his left shoulder, and continued it upward about the same distance. (20)

"There," he said, "that point is just between the bull's horns and over his right eye. The right eye of *Taurus* is a very bright star called *Aldebaran.* Anybody see it?"

"Oh, I do!" said Paul. "What, hasn't *Taurus* any left eye, Uncle Hen?"

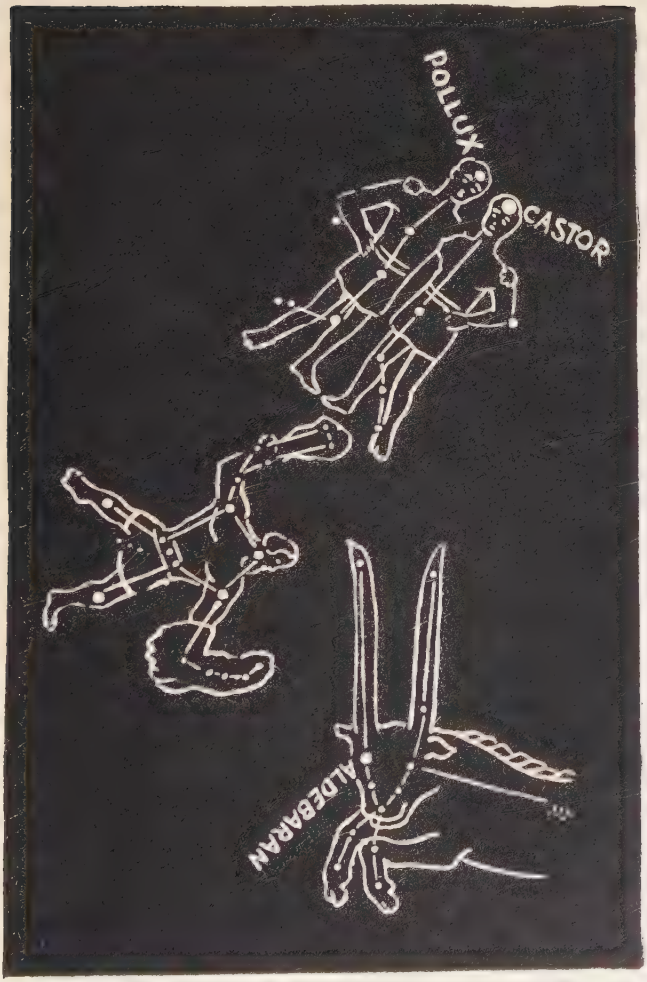
"He has," said Uncle Henry, "but he has it closed just now. He's winking it at *Orion* as much as to say, 'Oh, I act fierce, but I wouldn't hurt those twins after all. I'm just playing.' Go ahead and put in the stars for the bull's head and horns as fast as you find them, youngsters."

The children did, and when Uncle Henry had showed them the fore legs and shoulder, which contains the beautiful little group of faint stars called the *Pleiades*, *Taurus* looked like this:

"Now we want the twins!" cried Betty.

"All right," said Uncle Henry, "follow a line straight up the bull's left horn and a little more than the length of the horn beyond its tip and you will reach *Castor*, the head of the fainter twin." (21)

Peter and Paul began to show great interest, because they were twins themselves. They demanded that each be allowed to select one of the sky children and finish him completely, without Uncle Henry's assistance.


POLLUX
CASTOR
ALDEBARAN

Paul, having first choice because he was twenty minutes younger than Peter, selected *Pollux*, and Peter had to be contented with the less bright *Castor*.

It was not a difficult task for either of the boys, after finding the twin star *Castor*, for the head of *Pollux* is quite close beside it and the bodies of both star children stand side by side, with the feet just above *Orion's* uplifted club.

When *Gemini*, the twins, were finished, the blackboard looked like this, and since the children's fingers were so stiff with the cold that they could hardly hold the chalk, Uncle Henry moved that the Society of Star-Gazers adjourn until the next evening.

SECOND WINTER EVENING

IN WHICH THE DOGS OF ORION AND GEMINI FOLLOW THEIR MASTERS, PEGASUS ESCAPES AS USUAL, AND ANDROMEDA GETS A NICE SOFT BED OF HAY IN PLACE OF HER HARD OLD ROCK

"Uncle Hen," said Peter, when the Society was assembled round the blackboard, in overcoats and mittens, on the following night, "what is that very bright star that is down behind *Orion?* It looks sort of important to me."

"Right you are, Pete," answered Uncle Henry, looking where the boy pointed, "it *is* important. It is the star *Sirius*, the brightest star in the whole sky. We'll begin with it and find *Orion's* dog, or *Canis Major*, which is Latin for 'bigger dog.'"

"That's great!" exclaimed Paul, "you told us last Summer that we'd find him this Christmas-time."

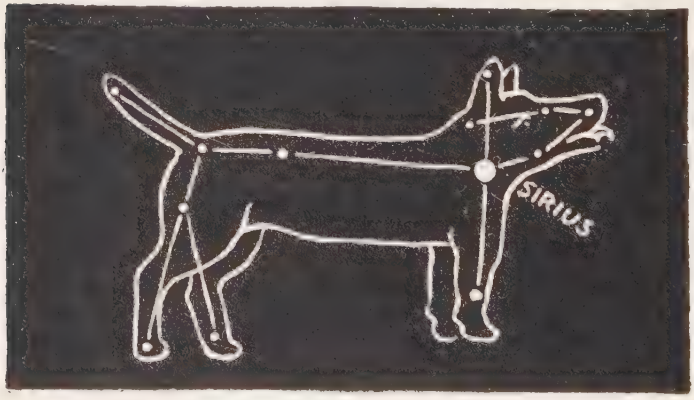
"So I did," agreed Uncle Henry. "Well, you can always find *Orion's* dog by drawing a line through *Orion's* belt and extending it behind him until it meets *Sirius*. (22) You can't miss it because it's so bright. Everybody see it?"

Everybody did.

"Now," went on Uncle Henry, "extend the line that came from *Orion's* belt, curving it slightly downward after it passes through *Sirius*, and you will have the dog's backbone. Put in the chalk

dots as we find the stars, Pete. Now draw lines upward and downward from *Sirius*, at right angles to the backbone line and you will have the dog's forelegs and ears. At a point on the backbone about twice the length of the foreleg from *Sirius*, you will find another fairly bright star, and below it a little way another star. Connect these two and keep on with the line, at right angles to the backbone, and you will find one hind foot. The other is not far in front of it. Yes, that's right, Betty, there's a star in the tip of his tail, too. And the three stars near *Sirius* make *Canis Major's* nose."

The children soon finished the skeleton and Uncle Henry took the chalk and put the flesh upon it. Then the dog of *Orion* looked like this:



"He's a faithful old fellow, isn't he?" said Betty, "to always follow Mr. *Orion* around like that?"

"I'm not always sure," said Uncle Henry,

"whether the dog of *Orion* would always be so faithful if it wasn't for the rabbit that is always just ahead of him, almost under *Orion's* feet."

"Oh, show us the rabbit!" cried Betty. Her father had promised her that when they all went to live in a house in the country, she should have a pair of them for her very own.

"All right, Betty," said Uncle Henry. "You can find *Lepus*, the rabbit, yourself. The three rather faint stars just below *Orion's* right foot make the curve of his back. Join them together with a curved line and extend it forward and downward until it passes through two brighter stars. The lowest of these is in the fore-shoulder of the rabbit. Now draw lines backward from both of these brighter stars, at about right angles to the line that joins them, and you will find the rabbit's hind hip and hind foot. He is lying down for a moment to rest. You see he's been galloping away from *Canis Major* for such a long time that he is tired."

"Poor little rabbit!" cried Betty, and her little face looked so pitiful in the light of the electric torch that Uncle Henry hastened to reassure her by saying that the big dog had never yet caught the rabbit, and by the very nature of things never could. Then she took heart to go on putting in the stars.

"Now," said Uncle Henry, "you can find the star in the rabbit's eye by drawing a line forward from the upper one of the brighter stars, and the star in his fore-foot by drawing another forward and downward from his fore-shoulder. That finishes his

skeleton, all except his ears. They are made by finding four faint stars just under *Orion's* left foot, and using two of them in each ear."

"Now can I draw his outline in, too?" asked Betty. "I want to make every bit of him myself."

"Of course you can!" exclaimed Uncle Henry indulgently.

"You've got to let me make all of the horse, then, when we come to him!" exclaimed Peter.

"In just a little while, Pete," said Uncle Henry, "we're making the rabbit now."

"All right," agreed Peter.

"Betty had looked longingly at rabbits in pet stores so often that she really did very well at drawing the outline of the sky-rabbit.

We leave it to you to better it. You can't—unless you love rabbits more than she did.

Betty's brothers were quite astonished, and pleased the little girl immensely by clapping their hands when the rabbit was finished.

"Now let me do the horse!" demanded Peter.

"What'll be left for me to do?" inquired Paul wistfully, "if you let Pete do the horse?"

"That'll be all right, Paul," reassured Uncle Henry, "the sky horse is very large, but we'll give you two smaller animals to do yourself to make up for him—*Aries*, the ram, and *Canis Minor*, the smaller dog."

"Fine," agreed Paul. "I know all 'bout rams."

The children laughed gleefully. Paul had been butted over once by a ram when they were on a summer visit to their grandfather's farm.

"Well, Pete," said Uncle Henry briskly, "you'll find *Pegasus*, the horse, grazing clear on the other side of the star field. Somebody built a box stall for him over there, but he's so big and strong that he doesn't stay in it except when he feels like it. He's all the time leaping the fence and escaping. When you find him, you'll see that he's doing that very thing now. In fact, you'll catch him right in the act!"

"Oh, let's hurry then!" said Peter, "he might be out before we see him do it!"

"Everybody find the big dipper," directed Uncle Henry. "You remember how we found the pole star in the tip of the little bear's tail by drawing a line up through the 'pointer stars' of the dipper's bowl, on the side away from the handle? Well, do that again now, and follow the line through the pole star,

passing behind *Cassiopeia* in her chair, and continuing until your line passes through two fairly bright stars quite a distance apart. (23) A line connecting these stars marks the top edge of *Pegasus*' box stall, which is called 'the square of *Pegasus*.'"

"*Cassiopeia* is about halfway between the pole star and *Pegasus*. A line drawn from the pole star through the back of *Cassiopeia's* chair will reach the two stars that form the lower corners of *Pegasus*' box stall." (24)

"Oh, I see the square now," said Peter.

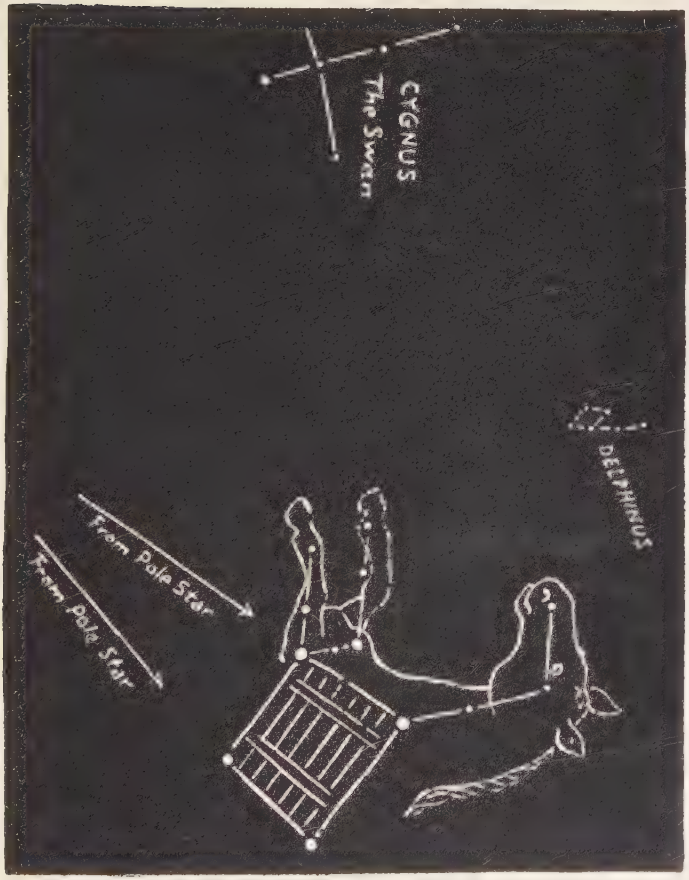
"Me, too," said Paul.

"It's very big, isn't it?" said Betty.

"Yes," agreed Uncle Henry, "and *Pegasus* is big, too. He is upside down just now, with his head just above the western horizon. His nose points northward toward *Delphinus* and his neck curves up from the side of the box stall that's away from the pole star. His fore feet curve up from the side of the square that is toward the pole star, and both feet point toward the swan."

"I see him now," cried Peter, and began putting in the chalk dots and lines for the framework of the box stall and the skeleton of *Pegasus*' head and forelegs, which are all of him that can be seen. As Uncle Henry said, *Pegasus* is just in the act of jumping out of his stall.

When Peter had finished drawing *Pegasus*, the horse of poets looked like this. Uncle Henry put in the arrows pointing from the pole star, and the skeletons of *Delphinus* and the swan.


CYGNUS
The Swan
DELPHINUS
From Pole Star
From Pole Star

"It seems to me," observed Paul sagely, "that *Pegasus*' box stall is a lot too small for him."

"That's why he is all the time jumping out and running away," explained Uncle Henry. "I told you that we should catch him in the act. He's always at it."

"Pete's had his turn; now I want to find the ram and the little dog," said Paul.

"If you'll wait just a little longer," said Uncle Henry, "I'd like to show Betty the last of the sky ladies, because she's right close to *Pegasus*."

Paul's face fell a little, but he said, "Ladies first, of course," as any gentleman would.

"I said she was a lady," said Uncle Henry, "but I'm not so sure that she is acting like one. In fact, she is in an attitude that few ladies would like to be seen in, at least not in the plain view of everybody who looks at the sky."

"What's she doing, Uncle Henry?" inquired Betty, in a tone that said, "I guess it can't be anything so *very* bad."

Betty was herself fond of climbing trees, in spite of motherly disapproval of such tomboy activities.

"She's lying flat on her back, with her arms and legs sprawled out and her head resting against the corner of *Pegasus*' box stall. I should think it might be very uncomfortable for her, unless she is lying on a pile of hay, for *Andromeda* has been there a very long time in the same position. The ancient Greeks said that *Andromeda* was chained to a

rock. Let's not have her that way; it would be so disagreeable."

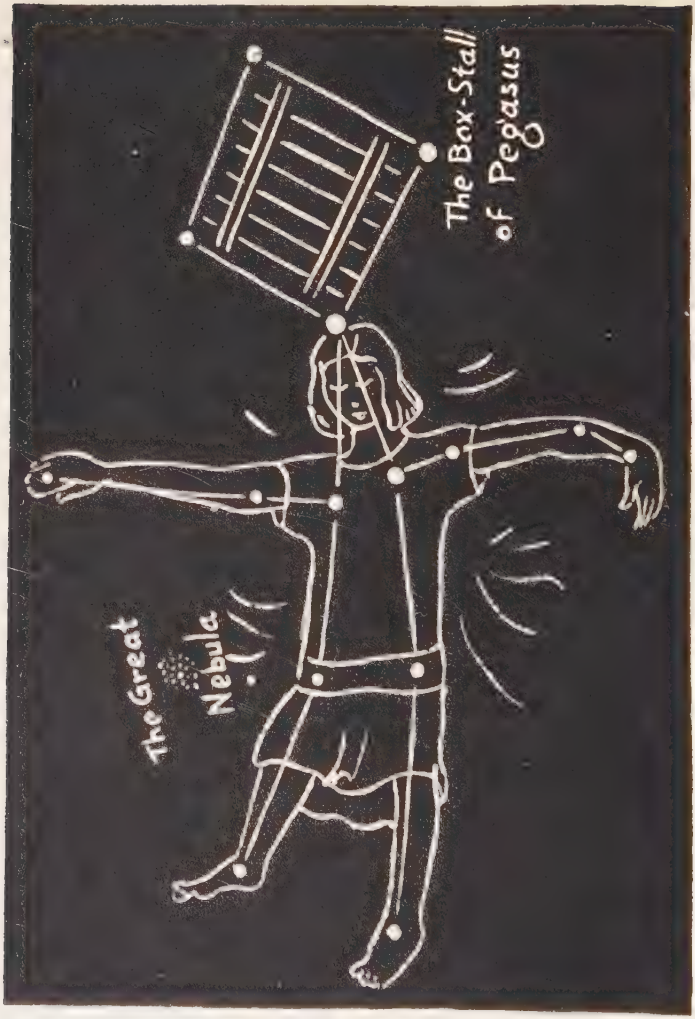
"She's probably asleep and doesn't notice, but we'll give her the hay," said Betty. "There's nobody to tell her not to lie down where she likes. How do we find her, Uncle Henry?"

"First look for her head," said Uncle Henry. "It is the same star we found forming the lower corner of *Pegasus*' square on the side toward the pole star. *Andromeda's* feet are just below the W-shaped *Cassiopeia*. A line drawn from the swan's beak through his tail, and extended across the sky, will reach the stars in the feet. (25) Another line drawn diagonally across the square of *Pegasus* to *Andromeda's* head and extended will pass along her body, and farther on, her left foot will be seen just above the line. You see her now, don't you, Betty?"

"Yes," said Betty, "and I think I see her arms."

"All right, draw her in," Uncle Henry encouraged.

Betty did, but didn't think she could draw well enough to outline the sleeping girl, so Uncle Henry did that. Then *Andromeda* looked like this:


The Box-Stall
of Pegasus
The Great
Nebula

Betty added a few lines to show that *Andromeda* was lying on a pile of hay, instead of being chained to that hard rock the Greeks insisted upon.

"What is that fuzzy little star just to her right, about at her hip?" asked Paul.

"I'm glad you noticed that," said Uncle Henry. "The astronomers who lived ever so long ago, long before the birth of Christ Jesus, noticed that it looked 'fuzzy,' just as you have, and called it 'the little cloud.' It is now called 'The Great Nebula in *Andromeda*.' If you looked at it through a telescope you would see that it is not one star, but a great many. Some of them, as astronomers who live now tell us, are as large as our sun."

"Ooh, how wonderful!" said Betty softly, and the boys' faces showed that they thought so, too.

"Some night," promised Uncle Henry, "we'll bring up a little telescope and look at 'the little cloud' again. It is a fine sight."

"Now," said Paul after a moment, "please can I find the ram and the little dog?"

"Certainly," said Uncle Henry. "Just as *Canis Major*, the bigger dog, follows *Orion* and belongs to him, so *Canis Minor*, the littler dog, follows and belongs to the star children, the twins named *Gemini*."

"Ooh!" exclaimed Betty, "just like 'Rags' belongs to Peter and Paul! We'll call the little dog 'Rags' when Paul finds him."

"Fine!" laughed Uncle Henry, "but I warn you that he won't come when you call him as well as the real live 'Rags' answers to his name."

"Where do I start?" inquired Paul, anxious to have his chance to draw.

"At the feet of the twins," directed Uncle Henry. "Draw a line through their feet and extend it away from the feet of *Pollux*, in the direction away from *Taurus*, the bull. (26) At a point about as far away from the foot of *Pollux* as the height of the twins you will find a bright star, and between it and the foot of *Pollux* a fainter one. Draw a line to connect them, and you have the little dog's backbone. You can fill in the rest of him any way you like, for those are the only two stars he has in him. I'll tell you one thing, though. The brighter star is at the little dog's tail instead of his head. The opposite was the case with *Orion's* dog."

The children found the two stars very easily and Paul put down dots of the right size to represent them. Then he drew the outline of the little sky dog, making him an Airedale, as you can see, so that he might be the same as his beloved flesh and blood name-sake "Rags."

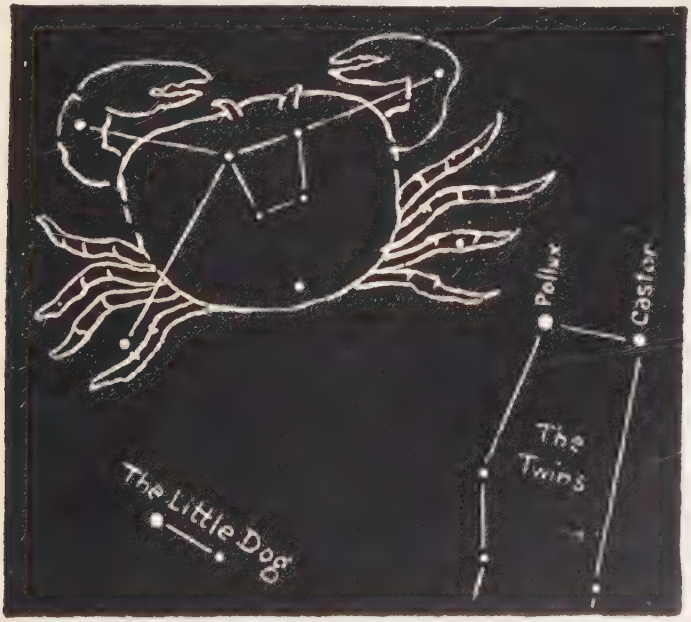
"Now that we've found the two dogs, that makes it easy to find *Cancer* the Crab," said Uncle Henry.

"Just draw a line from *Sirius*, in the Big Dog, through the Little Dog, and extend it almost as far again. (27) That's right. Now what do you see?"

The children searched the sky for some time, and Betty finally said, "Sort of a sprawly bunch of six or eight rather faint stars."

"Make little chalk-dots for them, then, Betty, and we'll try our best to make them look like a crab."

This shows how *Cancer* the crab looked when he was finished on the blackboard, and how he crawls in the sky away from *Canis Major* and *Gemini*, the twin boys. Perhaps he has learned by experience to leave boys and dogs as far behind as possible.

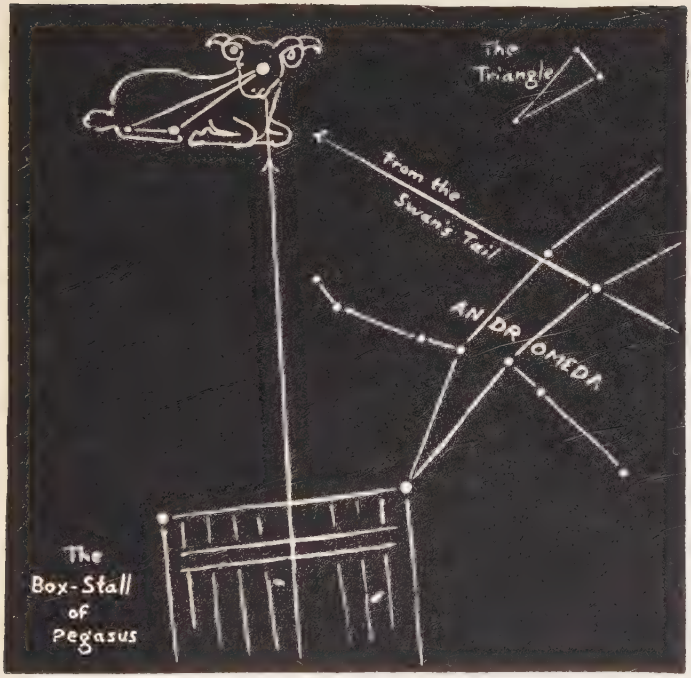


"Now let's find the ram!" said Paul. "I want to draw him."

"The ram," said Uncle Henry, "is very small, and is made of only three stars. A line drawn from the top corner of *Pegasus*' box stall, on the side next the pole, going straight down the side, and extended below it one and a half times the height of the stall, will point to the ram. (28) You can also locate *Aries*, the Ram, by drawing a line from the star in the swan's tail, across the stars in *Andromeda's* hips, and beyond them a little more than the distance from her head to her hips. Don't mistake a little triangle of stars that you will see just below *Andromeda's* left leg for the three stars of *Aries*. *Aries* is a triangle, also, but it has *two* fairly bright stars, while the triangle has only *one*. Do you all see *Aries*, the Ram?"

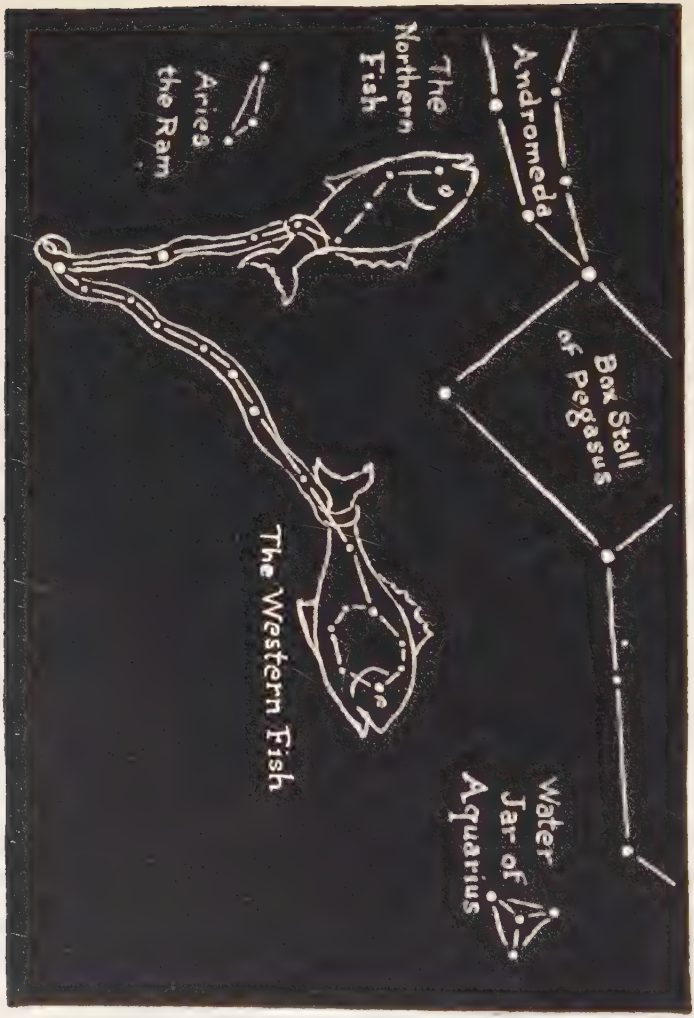
The children had all found it after a few moments, as well as the triangle under *Andromeda's* feet. When Paul had made the chalk dots and lines for *Aries*' skeleton, Uncle Henry drew the outline around them and the ram looked like this. You will see that in order to show *Aries* right side up, the blackboard had to be turned so that *Andromeda* was upside down.

"While we are in the neighborhood of *Pegasus* and *Andromeda* and *Aries* the Ram we may as well find the two fishes. One of them, called the *Northern Fish*, lies just about halfway between *Andromeda's* body and *Aries*—and the other, called the *Western Fish*, lies just back of *Pegasus*' box stall, quite close to the water jar of *Aquarius*. (29)



"The two fishes are tied together by their tails. The cord or ribbon runs eastward from the tail of the *Western Fish*, running about parallel to the side of *Pegasus*' stall, and then makes a sharp angle, coming back toward *Andromeda*, where it is fastened to the *Northern Fish's* tail."

When *Pisces*, or "The Fishes" were found and drawn with chalk they were in this relation to *Pegasus*, *Andromeda*, *Aries*, and *Aquarius*' Jar.


Andromeda
The Northern Fish
Aries the Ram
Box Stall of Pegasus
Water Jar of Aquarius
The Western Fish

"While I think of it," said Uncle Henry, "I want to tell you that sometimes you may find a very bright star in a constellation where it doesn't seem to belong. If you watch it for a few nights you will see that it moves. It isn't a star at all, but a *planet* or "wanderer." Sometime I'll show you how to know all the planets by sight and name. You will never see them except in the zodiac constellations, so they need not confuse you. And now I think all of us had better go downstairs and get warm before we go to bed. Besides, we want to leave a little to do to-morrow night, and there are only two constellations left now."

"Only two?" cried the children in disappointment.

"Only two that we can see well," assured Uncle Henry.

"Well," said Peter, "I guess we'd better have the Society adjourn. I move we adjourn."

"Second the motion," said Paul, with true parliamentary solemnity.

"Carried," murmured Betty, who was beginning to get sleepy in spite of herself.

THIRD WINTER EVENING

THE SKY CLOUDED OVER, BUT PETER FOUND THE STAR PEOPLE HIDING IN THE ALMANAC—PAUL FOUND HIS HEAD WAS THE WORLD—AND THE "SOCIETY" FOUND OUT ABOUT THE SWASTIKA AND THE ZODIAC, AND HOW YOU TELL WHEN A DIPPER IS A PLOUGH AND WHEN IT'S A WAGON

NEXT evening Peter and Paul carried the blackboard to the roof after supper, but soon returned in disappointment. The sky had all clouded over! The evening's session of the "Society of Star-Gazers" was spoiled. Its members stood in a circle about Uncle Henry and looked hopefully at him. Never yet had he failed to make good in an emergency.

"Well, it can't be helped," said Uncle Henry cheerfully. "We'll just have to bring Starland down here into our playroom for this evening. Suppose you get me—let's see—about a dozen sheets of paper from a big scratch pad, some of Betty's colored crayons—they had better be the dark-colored ones—and a good-sized sheet of stiff cardboard or Bristol board. Yes, and some pins and an Almanac. Betty'll get the colored pencils, Paul the cardboard, and Peter the sheets of paper and the pins. I'll borrow the Almanac from Katy. She has one in the kitchen."

The children scattered for the materials and Uncle

Henry took the shade off the electric lamp that stood on the playroom table.

When everybody was back in the playroom with the things needed the Society gathered around Uncle Henry and asked,

"Where do we go from here, Uncle Hen?"

"Out into Starland," said Uncle Henry, spreading out his arms wide. "This room is the universe. This lamp with the shade off is the sun. Imagine that the pictures on the walls are groups of stars, the constellations, the star-people we have been finding in the sky right along. Imagine that there are pictures on the ceiling, too, and on the floor. Lots of them, all over the six sides of this square room.

"Now Paul, you have a nice round head and have just had a hair-cut. Your head can be the earth. Just walk around the table once or twice until we get used to thinking about your head as the world. It seems rather small at first. That's right. Now you're going around the sun the way the earth does, from right to left, just opposite to the way the clock-hands go. You go once around the sun every year."

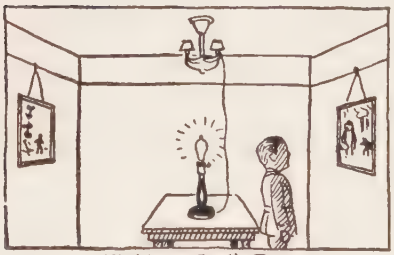
"The earth of course spins on its axis, too, just like a top, while it is circling round the sun. It turns round completely every twenty-four hours, from West to East. Paul, see if you can spin like a top while you are going round the lamp. Spin from right to left, just opposite to the way the clock-hands go."

Paul did his best to spin and walk at the same time, and Uncle Henry showed Peter and Betty that the side of Paul's head that was toward the lamp was

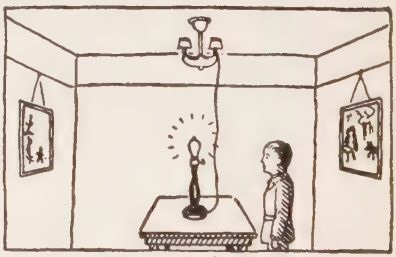
always bright, while the other side was always in shadow. As Paul turned on his axis from right to left his face became lighted, then the right side of his head, then its back, then the left side, and so on, round and round.

Part of the time Paul was facing a picture on one wall and the next minute his back was toward that picture and he was looking at another picture on the opposite wall, across the lamp.

These two drawings show how Paul faced the two pictures one after the other.



Night on Paul's Face



Day on Paul's Face

"Now tell me," commanded Uncle Henry, "which picture you see the plainest—is it the one you see when your back is to the lamp—or is it the one you see when you face the lamp, and look across it toward the picture on the wall beyond?"

"The lamp is so bright without a shade that it blinds me when I try to see the picture beyond it," said Paul.

"Oh, I see! I see!" said Betty, beginning to hop up and down. "Can I tell, Uncle Henry?"

"Surely," laughed Uncle Henry, "what do you see?"

"When Paul faces the picture with his back to the lamp," said Betty, "it's night on his face, and day on the back of his head! Is that right?"

"Yes, go on," encouraged Uncle Henry.

"And so he can see that picture better, 'cause the lamplight isn't in his eyes. But when he faces the lamp and looks across it, then it's day in his face, and night on the back of his head, and he can't see the picture beyond the lamp very well, 'cause the sun-lamp shines in his eyes."

"So that's why we can only see the stars at night!" said Peter.

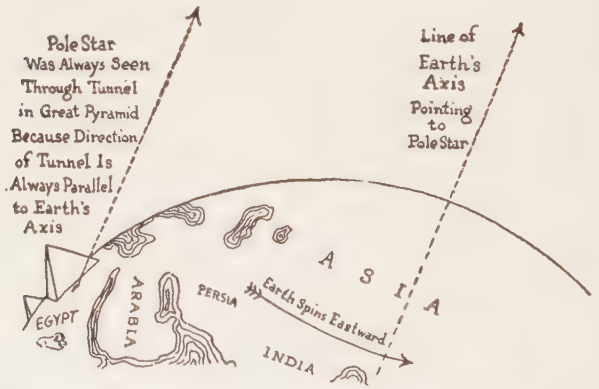
"Yes, that's why the moon and the stars come out only when it gets dark," said Uncle Henry. "You see the earth turns round and carries us to its dark side, the side that is away from the sun. We say 'The sun has set.' Then when the sun glare is gone from our eyes we can see the sky-pictures, just as Paul sees one picture better with his back to the lamp than he does the other when he has to look through the lamp-light toward it."

"And the stars are in the sky all day long, whether we see them or not?" asked Paul.

"Certainly," said Uncle Henry. "If you could look up at the sky from the bottom of a very deep well, or a tall chimney, so that the sun-light was kept out of your eyes, you could see the stars shining in the daytime. There is a long deep tunnel in the great pyramid of Egypt that goes up and out from

the centre of its base toward its north side at just the right angle so that the ancient Egyptians could always see the pole star through it—no matter whether it was night or daytime. You see the pole star never rises or sets, because it is always right over the end of the axis that the earth spins on."

This picture shows how the tunnel in the great pyramid always pointed to the north star because the tunnel is always parallel to the axis the earth spins on.


Pole Star Was Always Seen Through Tunnel in Great Pyramid Because Direction of Tunnel Is Always Parallel to Earth's Axis
Line of Earth's Axis Pointing to Pole Star
EGYPT
ARABIA
PERSIA
Earth Spins Eastward
INDIA
A S I A

When the pyramid was built, the star in the tip of the little bear's tail was not the pole star, as it is now. At that time the star that was nearest the pole was one of those in the dragon. Since the pole of the earth goes round in a complete circle among the stars every 25,000 years, the star in *Draco* will some time be the pole-star again—in, say 20,000 more years!

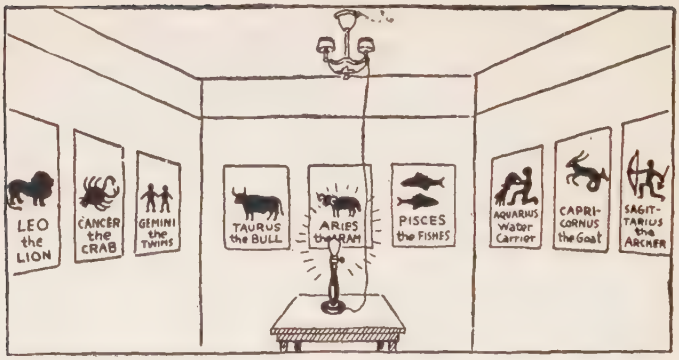
Peter had picked up the Almanac that Uncle Henry had borrowed from Katy and suddenly cried,

"Oh, Uncle Henry, the Almanac has a lot of the Star People in it. It calls them 'The Signs of the Zodiac.' What's the Zodiac, Uncle Hen?"

"We are going to find out right away, Pete," said Uncle Henry, "but first we must draw pictures of the twelve star folks that are the Zodiac signs. That means three drawings apiece. Pull up your chairs to the table and we'll draw on the sheets of scratch paper with Betty's colored pencils. Paul, you do the *Virgo*, *Leo*, and *Cancer* the Crab; Peter will draw *Gemini* the Twins, *Taurus* the Bull, and *Aries* the Ram; Betty will do the Fishes, called *Pisces* in Latin, *Aquarius* the Water Carrier, and *Capricornus* the Goat; while I will draw *Sagittarius* the Archer, *Scorpio*, and *Libra* the Balance. All old friends of ours."

"We'll put the Almanac here in the middle of the table where we can all see it while we copy the 'signs,' one on each sheet of paper."

Everybody was very busy indeed for about half an hour. At the end of that time the twelve rough drawings were done and pinned up at equal distances apart around the walls of the playroom, three on each of the four walls. They were arranged around the room in the same order in which Uncle Henry had assigned them. The room then looked like this, though of course you see only three walls in a picture. You must imagine how the fourth wall looked.

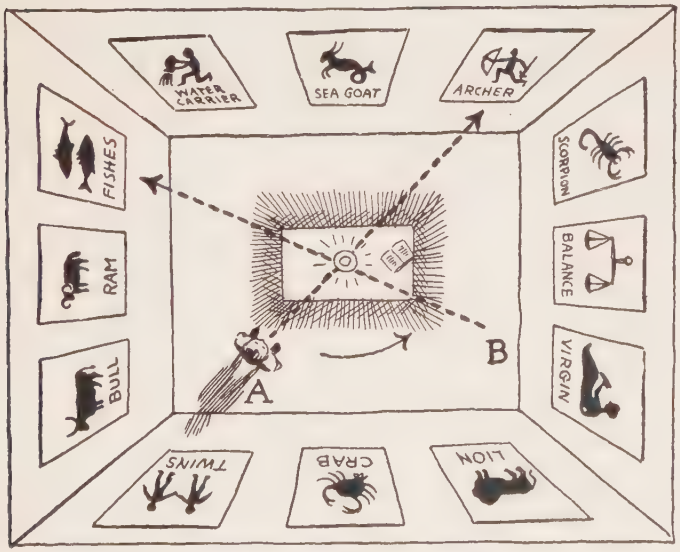


"Now Paul, suppose you walk around the table again, spinning on your own axis as you go, and we'll try to find out what the Zodiac is. You notice that the pictures are all pinned on the walls at the same height from the floor, which is just the height of the electric lamp bulb, and just the height of Paul's head too, no matter where he is in his walk around the lamp. The twelve constellations, or signs of the Zodiac are in the real sky also on the same level with the earth and the sun, no matter where the earth is in its journey round the sun. Astronomers say it this way: they say that the earth revolves around the sun 'in the plane of the ecliptic.' That simply means that if the sun was in the centre of an enormous horizontal pane of glass, the earth and all the signs of the Zodiac would also always be touching the pane of glass, which would then represent the 'plane of the ecliptic.' Put an l in 'pane' and you have 'plane.'"

"Is each sign for a month?" asked Peter. "I see there are twelve of them."

"That's correct," said Uncle Henry, "and you want to notice that as Paul walks round the lamp and looks across it at the signs on the wall beyond it, the lamp seems to Paul to move from one picture to the next."

This picture is drawn as if the ceiling of the room was taken off and you could look down on Paul walking around the lamp.



When it is January first, Paul, representing the earth, is in the position marked A, nearest to the picture of *Gemini* behind him, while the lamp, representing the sun, appears to him to be entering the sign of the Zodiac called *Sagittarius*, directly opposite across the room. Later, on April first,

after three months, Paul, or the earth, has traveled a quarter of the way around the sun, has passed the pictures of *Cancer* and *Leo* on the wall behind him, and stands nearest *Virgo* in the position marked B. The lamp has also seemed to move through a quarter circle, has passed through the signs of *Capricornus* and *Aquarius*, and appears to Paul to be just entering the sign of *Pisces*, or the Fishes. In the same way the earth moves through a sign of the Zodiac every month and the sun, while really motionless, *appears* to also travel through a sign every month. Of course we cannot see the sign or constellation, where the sun appears to be, at the

same time we see the sun, for his brightness makes the stars invisible, but if we *could* see the constellations by day, the sun would appear to travel from one sign of the Zodiac to the next every month."

Here is a clock of the year which shows the earth at one end of the hand, the sun in the middle, and at the other end of the hand an arrow, which points to the sign of the Zodiac where the sun appears to be, and to the date when it seems to be there to an observer on the earth. Draw the hand with the earth-end in several different positions and you will see that the sun, if viewed from the earth, would appear to be in the sign of the Zodiac exactly opposite.

When the children all understood the way the Zodiac divides the yearly path of the earth into twelve equal parts, Betty said, "I want to know why the geography globe at school always looks just as if it was going to tip over."

Uncle Henry laughed. "If you think the geography globe looks unsteady because its axis of iron rod is on a slant, what will you think about the earth when I tell you that it spins around in just the same slanting position, with only an *imaginary* line for axis?"

"Does it really?" asked Betty.

"Yes," said Uncle Henry, "and it spins so steadily in that slanting position that the north end of its imaginary axis always points toward the same place, a point very close to the north star, or *Polaris* as it is called."

"*Polaris* is named for the North Pole, I suppose," said Peter.

"That's right," Uncle Henry replied. "Let's get some scissors and we'll use our big sheet of cardboard to make a cap for Paul's head that will show you just how the slant of the earth's axis makes it hotter in summer and colder in winter."

"Ooh!" exclaimed Paul, "I always thought it was hot in summer because the earth got nearer to the sun then."

"Lots of people think that, too," said Uncle Henry, "but it isn't so. The earth is really farther from the sun in summer."

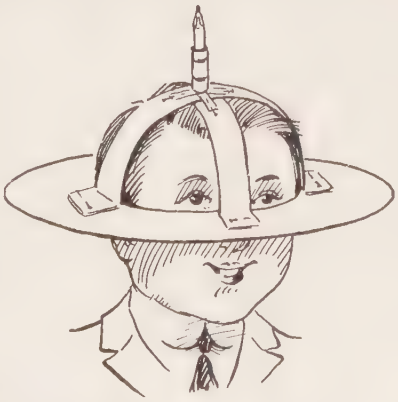
Betty ran for the scissors, and Uncle Henry cut out a big circle from the stiff cardboard. Then he cut out an opening in the centre of it that fitted Paul's head just as a stiff straw hat would that was a size too big for him. The circle of cardboard dropped down until it rested on Paul's ears and on the bridge of his nose. This cardboard brim represented the "plane of the earth's equator," just as the pane of glass represented the "plane of the ecliptic." Since the "plane of the equator" is always at right angles to the slanting axis of the earth, the "plane of the equator" is always at a slant to the "plane of the ecliptic."

If you will run a long hat-pin through an orange, and sink the orange exactly to its middle in a glass bowl filled with water, holding the hat-pin at a slant, you will see that the equator of the orange is at a slant with the surface of the water. Half of the

orange's equator curves up above the water, while half of it curves down under the water's surface. If you fasten a cardboard ring around the orange at the equator the cardboard will then be at an angle with the surface of the water, which represents the "plane of the ecliptic."

Uncle Henry cut two long strips from what was left of the cardboard and crossed the strips over the top of Paul's head, fastening the four ends of them to the round cardboard brim close to his head.

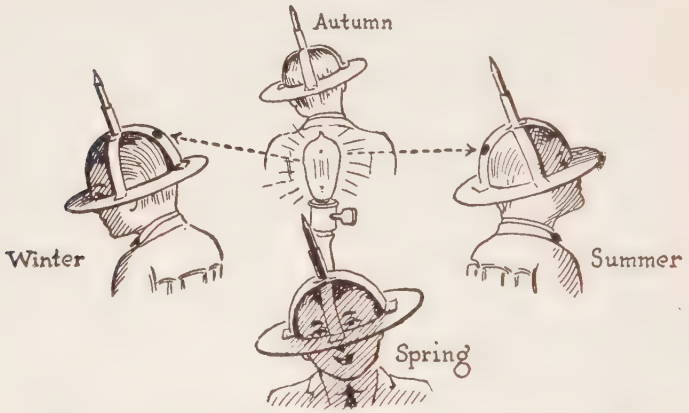
After this Uncle Henry rolled a sheet of the scratch paper round a pencil, put rubber bands tightly around it, cut the end to bend up and make a foot and pinned the foot to the cardboard strips at the place where they crossed. When Paul had it all on he looked very funny with the pencil sticking straight up from the top of his head, and his eyes just peeping over the card board brim on each side of the strip down the middle of his nose.



"Now come on, Mr. Earth," said Uncle Henry, "It's time for you to spin round the lamp-sun for another year or two."

So Paul held his head on a slant and kept it so that the pencil always pointed in the same direction as

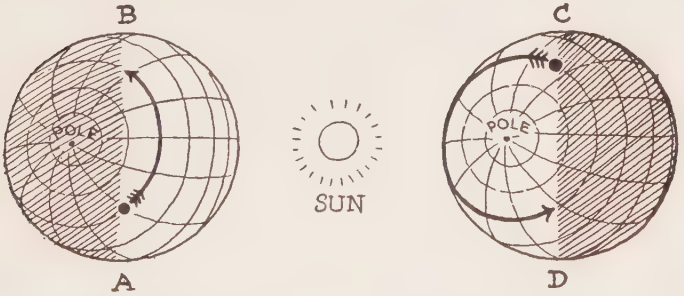
he went round the lamp. These four little pictures show how he looked at the four sides of the sun where the earth is in Winter, Spring, Summer, and Autumn.



"Now," said Uncle Henry, "you see that if we make a black dot on one of the cardboard strips about halfway between the cardboard brim, or the earth's equator, and the pencil, or the North Pole, it will be about as far north as we are in the United States. And when Paul is in his Summer position, with the pencil slanting *toward* the 'sun,' you see that the sun's rays beat down much straighter on the black dot than they do when he is on the other side of the lamp, with the pole slanting *away* from the 'sun.' That is why the Winter sun appears to be lower in the sky at noon than the Summer sun, and also why the Summer sun shines hotter on the earth than it does in Winter. Notice, too, that the rays from the lamp light up Paul's head for quite a little

way beyond the foot of the 'pole' when it slants *toward* the 'sun,' while when it slants *away* from the 'sun' the rays fail to reach the 'pole' at all. This means that in summer the sun shines a longer time upon the part of the earth that slants toward it. If you could look down from the ceiling at Paul's head in his Summer position and in his Winter one you would see why."

Uncle Henry quickly drew these two pictures of the top of a globe to show the children why the days are long in Summer and short in Winter at any point in the United States.



The Winter Day lasts while the black dot on the earth travels from A to B—less than half-way round.

The Summer Day lasts while the black dot on the earth travels from C to D—more than half-way round.

"It's just like the hot water bottle mother kept in my bed that time I had a chill after swimming," said Paul. "The hotter it was before she put it in the bed the slower it cooled off."

"That's the idea," said Uncle Henry, "the longer the sun shines on any place on the earth the hotter

it gets, and when the nights are as short as they are in Summer the place hasn't long to cool off before it is round in the sun's hot rays again. Now do you see why Summer is hotter than Winter?"

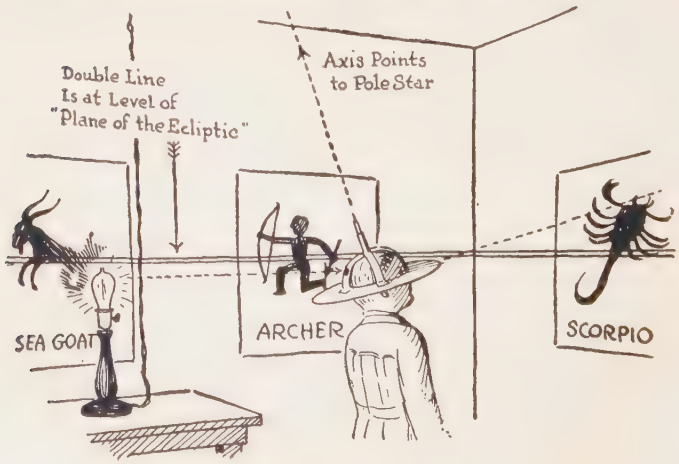
The children did.

"There's one thing I don't understand, though," said Peter. "Why are there different stars in the sky in Winter than there are in Summer?"

"That's easy to answer," said Uncle Henry. "Look at Paul again—first when it's 'night' on his face on the 'Summer' side of the lamp, and then when it is 'night' on his face on the 'Winter' side of the lamp.

"At 'night' in Summer Paul looks at the pictures on one end of the room. The cardboard brim, or 'plane of the equator,' is slanted *up*, above the 'plane of the ecliptic.'"

This picture shows how Paul looked.



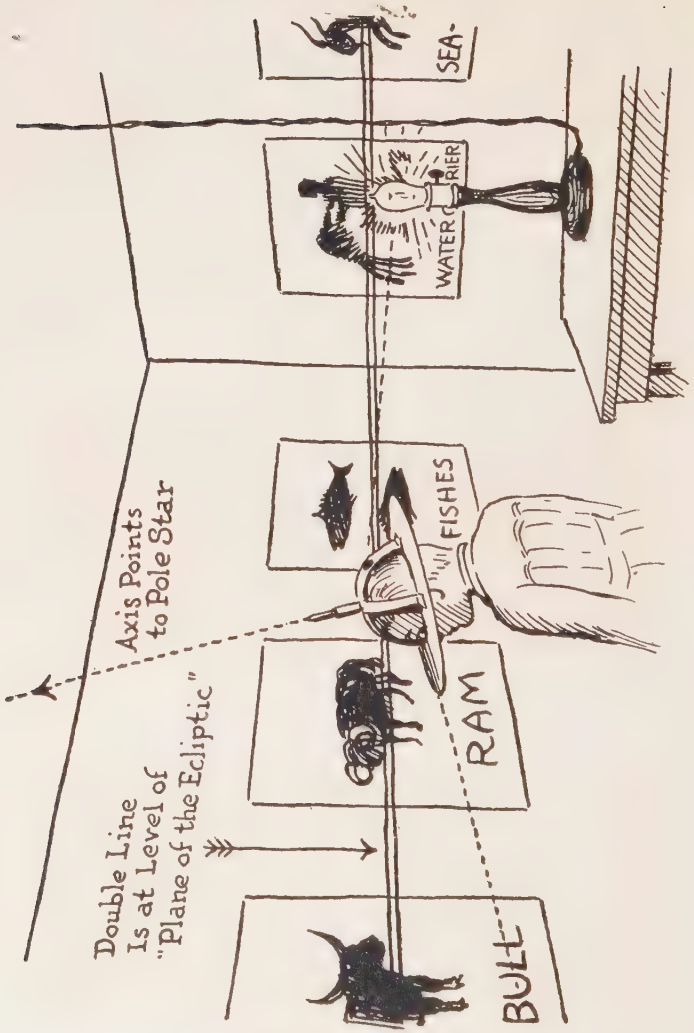
"But in Winter, at 'night,' Paul looks at quite different pictures, at the other end of the room. The cardboard brim is slanted *down*, below the level of the 'plane of the ecliptic.' This is why the path of the Winter Signs crosses the sky higher up than the path of the Summer Signs. In both Winter and Summer you must imagine the cardboard brim to be as transparent as glass, for the 'plane of the equator' is in reality only imaginary."

This next picture shows how Paul looked at the constellations at "night" in Winter.

"Of course the north star and the stars for a considerable distance round the pole never set, and can be seen all night at any time of the year. It is only the ones that rise and set that go and come from our sight with the seasons. In reality they never leave us, for if it wasn't for the sunlight getting in our eyes by day, we could see the Summer night star-pictures in the Winter daytime, and the Winter night star people in the Summer daytime. We are just looking at opposite ends of our big room in the universe on Winter nights and Summer nights, that's all," said Uncle Henry.

Uncle Henry took some folded papers from his pocket and spread them out on the table.

"Here are four maps of the sky," he said, "which show the way it looks at different seasons at 9 o'clock in the evening—on January 1st, April 1st, July 1st, and October 1st. You will see that the groups of stars around the pole are always in view, while the rest of the star people change with the seasons, but


Double Line
Is at Level of
"Plane of the Ecliptic"
Axis Points
to Pole Star
BULL
RAM
FISHES
WATER
SEA-

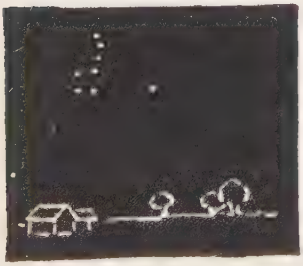
even the groups around the pole change their positions with the seasons.

"You have all seen the *Swastika*. It has been known and used as an ornament for hundreds of years, all over the world—by the American Indians, the Chinese, the East Indians, and many others. I'll show you where I think all these widely separated people got the *Swastika*, and how it stands for the four seasons."

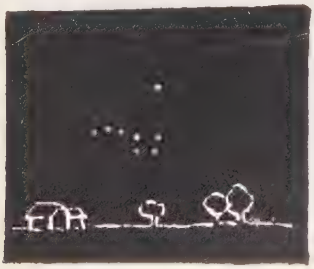
Uncle Henry drew four little pictures showing the four positions in which the big dipper stands in the four different seasons, with its "pointer stars" always indicating the pole star.

At the right of the pole star in Winter.

Above the pole star in Spring.



At the left of the pole star in Summer.



Below the pole star in Autumn.

Then he drew all four positions on one sheet of paper, like this:

And when heavy lines were drawn along the handles of the dippers and across the pole star from bowl to bowl the *Swastika* suddenly appeared like this:

The Society of Star-Gazers was very enthusiastic about the origin of the *Swastika*, and found the dipper in its different positions on all of the four maps that Uncle Henry had put on the table.

You can see the position of the dipper and all the other stars at January 1st, April 1st, July 1st, and December 1st, at 9 o'clock in the evening, by looking at the four maps inside the covers of this book.

After the children had looked at all the four maps as long as they wanted to, Uncle Henry suddenly remembered to look at his watch and exclaimed,

"My goodness! I guess it's about time the Society adjourned for to-night. Ten o'clock! I'll get scolded for keeping you up so late."

"I want to ask just one thing more," pleaded Betty.

"All right, what is it?" said Uncle Henry.

"Who found all the sky people?"

"Well," said Uncle Henry, "now that's a long story. They were all found and named so long ago that nobody knows who did it. The inventors of the star people naturally thought they saw pictures in the sky of the things they were familar with in everyday life—the bear, the bull, the serpent, the archer, and so on. If they had had any steam engines then somebody would have drawn lines from star to star until they had a picture of one in the sky. In England the Great Bear or Dipper is usually called the 'Plough' and you can see why

"It is also called 'Charles' Wain' or wagon.

"We only know that the constellations are very, very old, and that an ancient people living in the valley of the Euphrates river probably named most of them. The Babylonian Tablets, the oldest records known, show that the Zodiac constellations were known over 3000 years before the birth of Christ, which is now nearly 5000 years ago."

"Can't we have just one more poem before we go to bed?" said Paul.

"Yes," said Uncle Henry, "but not one of mine. I'll give you a little bit of a long poem that was written by a man named *Aratos* about 280 years before the wise men followed the star that told them where to find the new-born Christ. It has been running through my mind all the evening. This is it:

"And all the signs through which Night whirls her car,
From belted *Orion* back to *Orion* and his dauntless Hound,
And all *Poseidon's*, all high *Zeus's* stars,
Bear on their beams true messages to man."

LIBRARY

FOURTH WINTER EVENING

IN WHICH THE "SOCIETY" MEETS THE LAST OF THE STAR PEOPLE AND THE BEGINNING OF ASTRONOMY—AND BETTY PROPOSES A "NOTE" OF THANKS

THE Society of Star-Gazers assembled upon the roof the next night with an eagerness that was tempered a little by regret that it *was* the last.

Uncle Henry saw this, and before starting to find the evening's constellations with the children, told them a few of the many wonderful things to be seen among the stars with the aid of a small telescope.

He reminded them of the "little cloud" in *Andromeda*, called the Great Nebula, and said that there were not only many more of these wonderful clouds of star dust, but numbers of beautiful double stars, some of them lovely with tints of red, green or orange, and some that can be seen with an ordinary opera-glass.

Then he told them of the curious variable, or "winking" stars, which turn bright and faint alternately on a regular schedule, so many hours bright, and so many hours faint. Also he described the beauty of the planet *Jupiter*, surrounded by its four little moons, all of which could be seen with a small telescope.

Then the children began to feel more cheerful,

for they saw that being introduced to the creatures and people of Skyland was only the beginning of the study of astronomy.

"So," finished Uncle Henry, "we don't need to feel that there is no more fun coming, for there are lots more faint constellations which are all beautiful, even though not plain enough for us to find easily in the beginning. Besides, if you ever journey to the South, beyond the earth's equator, you will find a whole new sky full of marvelous people, and creatures, and objects—all pictured in the flashing southern heavens."

"Well," said Peter briskly, "what do we find to-night, Uncle Hen?"

"We'll begin," replied Uncle Henry, "with a person you may have heard of—*Perseus*, who killed the terrible Gorgon *Medusa*."

"Oh, I know him," cried Paul, "we read all 'bout him last year."

"Quite right," said Uncle Henry, "then you remember that when he had killed *Medusa*, and cut off her head with his sword, he had to hold the head with the terrible face away from him, because everybody who looked at that face was instantly turned to stone."

"Yes, yes, we know!" chorused the Society.

"Well, now we'll find *Perseus*, his sword, and the head of *Medusa*," promised Uncle Henry. "All you have to do is to extend the line of *Andromeda's* left leg and prolong it from her foot, straight out for about her whole length. (30) There you will find

Algenib, the brightest star in *Perseus*. It is right in his neck, between his shoulders. From *Algenib* you can trace a row of stars downward, almost to the *Pleiades* in the bull's shoulder. This row of stars is *Perseus*' body and legs. Then find two stars above *Algenib*, one over the other, and you have his head and helmet.

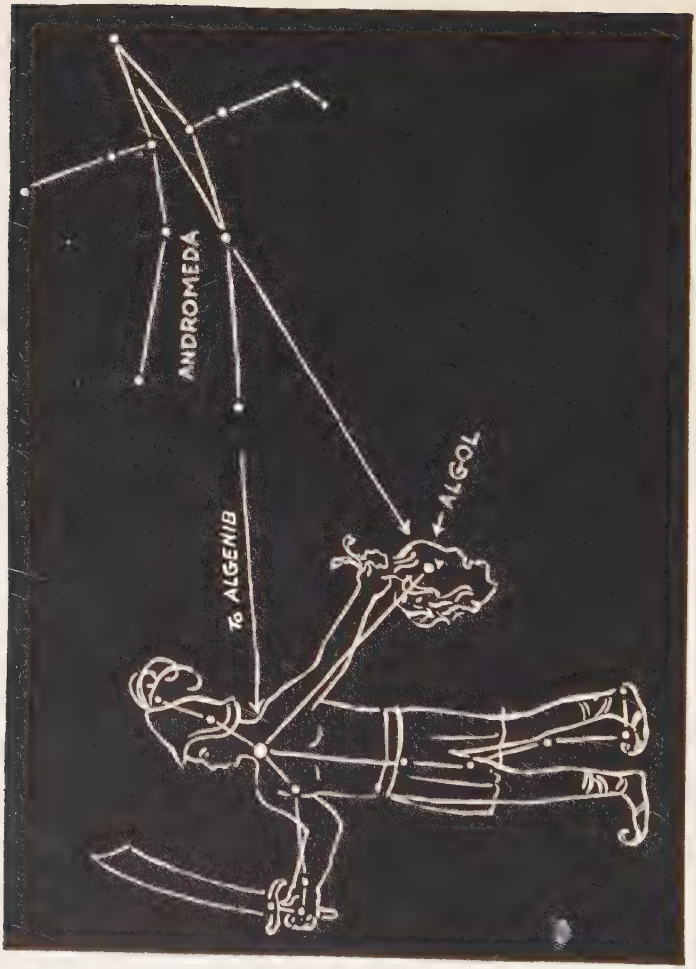
"After that it is easy to start at *Algenib* and trace out his right arm, with the sword. A line drawn toward *Perseus* through the stars in *Andromeda's* head and left hip points out the star *Algol*, which is the head of *Medusa*, held in *Perseus*' left hand. (31) *Algol* is a famous variable star, which the ancients named 'the dragon of the slowly winking eye.'"

The children soon found all of *Perseus*, and all took part in drawing his skeleton on the blackboard. Then they watched *Algol* in the sky, and expected to see it wink, until Uncle Henry told them that the wink is so slow that it takes seven hours for *Algol* to become faint and bright again, and that then two and three-quarter days pass before *Algol* winks again. This being the case the Society decided not to wait, and finished *Perseus* up so that he looked this way:

Uncle Henry added the lines with arrows to show how *Algenib* and *Algol* are found, with the help of *Andromeda*.

"After *Perseus* was finished, Betty kept gazing at the sky. She seemed fascinated, and finally asked,

"Uncle Henry, there's a perfectly lovely star just a little way in front of *Perseus*, and three little ones


ANDROMEDA
TO ALGENIB
ALGOL

near it. If I could name stars I would call them 'the hen and chickens,' wouldn't you?"

All the children looked, and easily found the beautiful star. They couldn't have missed it, and neither can you, for it is one of the most brilliant in the sky and there are no others like it nearby.

"Yes," said Uncle Henry, "the big star and the three little ones do look like a hen and her chickens. I would call them that, too, Betty, but hundreds of years ago somebody named the bright star *Capella*, which means 'the goat,' and called the three little stars 'the kids,' so you see that they are named already."

"A kid is the baby of a goat, isn't it, Uncle Hen?" inquired Peter.

"Yes, that's the idea," said Uncle Henry, and went on, "Betty happens to have picked out the brightest star in the last constellation we are going to find. It is called *Auriga*, or the Charioteer. He hasn't his chariot with him."

"How do we find *Auriga?*" inquired Paul.

"He is very plain, almost as plain as *Orion* himself," said Uncle Henry. "*Capella* is at one corner of a five-sided figure, called a 'pentagon.' (32) It is also in the left shoulder of *Auriga*. Find the tip of the left horn of *Taurus*, the Bull, and you will have another corner of the pentagon, and at the same time the right foot of *Auriga*. When you have those points it is easy to find the other three corners, which are the right shoulder, left foot, and the right hand of *Auriga*. He holds his whip in that hand.

Even though he had to leave his chariot when he went into the sky, he insisted on taking his whip along. It comes in very handy, too, sometimes, when the two lions up there become fretful and uneasy. When you have found *Auriga's* shoulder stars, just draw two lines upward to a star above and between them and you finish the charioteer's skeleton. The star at the point where the lines cross is in his head. See him, everybody?"

The children had no trouble in putting in the stars and drawing the skeleton. Neither will you, for *Auriga* is very conspicuous, and almost straight overhead in the evening about Christmas time.

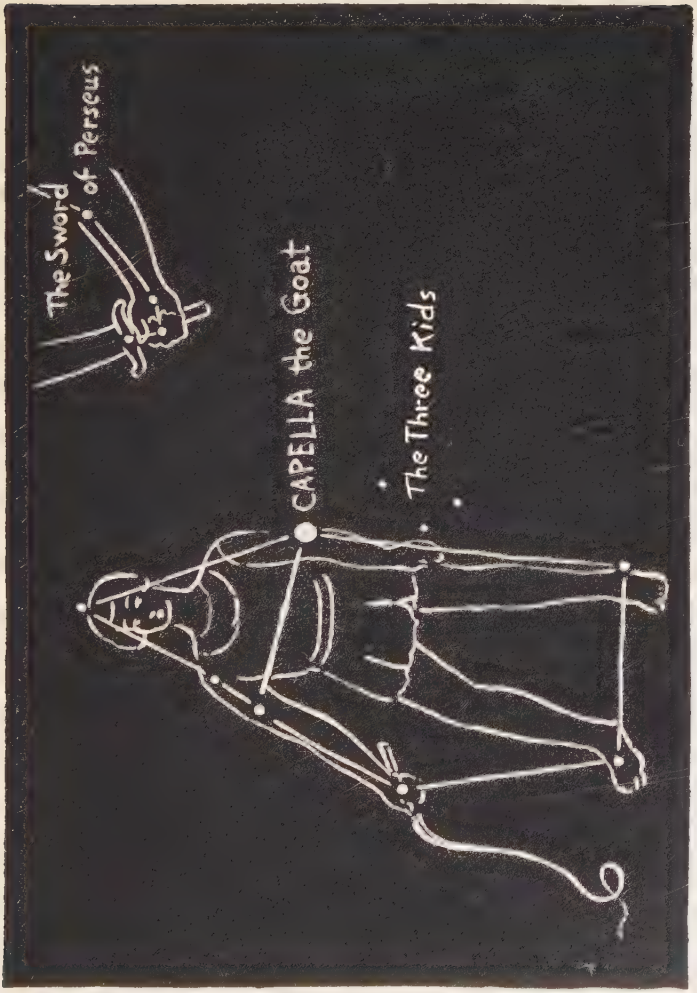
This is the way *Auriga* looked on the blackboard:

When the children had finished looking at *Auriga*, and *Capella* the Goat and her three babies, Betty drew herself up very straight and said, trying to look very dignified,

"Mr. Chairman, I move that The Society of Star-Gazers give Uncle Henry a note of thanks for giving us such an instructive, and—and—oh, we've liked your Christmas present an awful lot, Uncle Henry!"

Peter was going to say that it was a *vote* of thanks that people got from societies, but Betty was so earnest and dignified that he didn't really want to take her down just then, so he joined Paul in seconding the motion and was appointed by Betty as a committee of one to write the "note" and deliver it to Uncle Henry later.

Uncle Henry looked quite serious, for him, and said that he had made up a little poem that they


The Sword of Perseus
CAPELLA the Goat
The Three Kids

might like to hear while standing under the Christmas stars.

The Society voted unanimously in the affirmative, so Uncle Henry recited,

"'There was once a star of old,
Wonders to three wise men told.

Where it led, there followed they—
Stars had taught them how to pray,
How to know the Truth from lies—
God had taught them through His skies.

Where the star led, followed they,
Found the Christ-child, laid in hay—
To His mother, in the stable,
Brought Him gifts that they were able.

Stars lead us to Christmas Truth—
Let us look, with eyes of youth!"

Then, in a moment more, Uncle Henry and the children were gone, and the sleepless, faithful stars were alone, brooding lovingly over their tiny baby brother, which we call the great world.

The author desires to express his indebtedness to the following books, which have given him many hours of enlightening pleasure while riding the star-gazing hobby:

A Field Book of the Stars	Olcott
Star Lore of all Ages	Olcott
The Heavens and Their Story	Mrs. Maunder
Astronomy	Jacoby
Astronomy from a Dipper	Clarke
New Astronomy	Todd
Astronomy	Lockyer

He also wishes to add his appreciation of the monthly pleasure given by "The Evening Sky Map," published by Leon Barritt.

Printed in the United States of America

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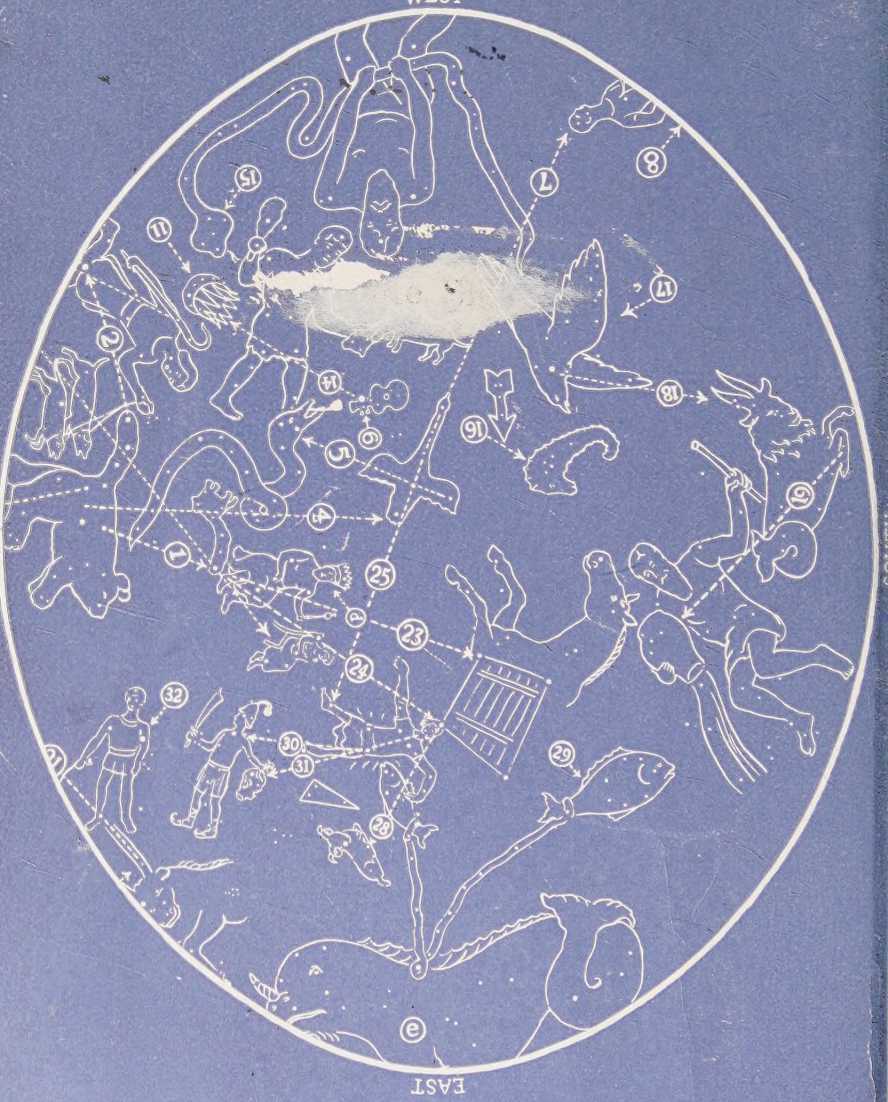

These Star People You Will See on Oct. 1st, at 9 o'clock in the Evening

ese Star People You Will See on Jan. 1st, at 9 o'clock in the Evening

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